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지리학석사 학위논문

# Value Chains and the Middle Income Trap

: The case of the sugar industry in  
Northeastern Thailand

가치 사슬과 중진국 함정: 태국 동북부의 설탕  
산업을 사례로

2014 년 8 월

서울대학교 대학원

지 리 학 과

최 우 혁

# Value Chains and the Middle Income Trap

The case of the sugar industry in  
Northeastern Thailand

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## **Abstract**

# **Value Chains and the Middle Income Trap**

## **The case of the sugar industry in Northeastern Thailand**

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For several decades, Thailand has successfully accomplished economic development. Rapid growth has started since early 1980's and Thailand could be one of the leading countries in the Southeast Asian Region. However, this development trajectory is questioned in various perspectives. One of it is the Middle Income Trap. Even though the term 'Middle Income Trap' is not precisely defined, there are doubts Thailand is whether trapped in the middle income status or not. Another aspect is regional disparity. It is already well known that Bangkok and suburban areas are prospering while other regions, especially Northeastern are lagging behind.

As the Middle Income Trap is usually adopted for macro scale and Northeastern is the most underdeveloped region in Thailand, this paper

attempts to scrutinize the Middle Income Trap in another perspective. Sugar Industry which is prevalent in Northeastern Thailand is chosen to analyze how the aspects of the Middle Income Trap are revealed in the industry and region. To research on this subject, Global Value Chain framework is adopted. Specifically, this study focuses on the upstream sugar value chain and scrutinizes the relation between the sugar cane farmers and the millers. Fieldwork was performed at the sugar cane fields, rural villages and weighing stations of Khokpochai and Manchakhiri district.

It is found that upstream sugar value chain can be termed as ‘State-led Markets value chain’. Price is highly controlled by government body, so price cannot be a proper signal to coordinate the agents within the value chain. The upstream sugar value chain shares several aspects of the Middle Income Trap; low level of investment and R&D activities, labor shortage and weak institution. Several implications are described for these problems within the value chain. Even though this study cannot be generalized, it is meaningful to ‘think’ the Middle Income Trap not only in a broad scale but in regional and industrial context.

Key Words : the Middle Income Trap, Global Value Chains, Sugar Industry, Northeastern Thailand

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# **I. Introduction**

## **1.1 Background and Objectives of the Study**

Recent figures indicate that Thailand have accomplished a successful economic development in the past several decades. Since 1960, the Thailand's national economy expanded 15-fold, increasing from under \$9 billion to over \$140 billion in constant 2000 price (Richter, 2006). In spite of financial crisis in 1997, the economic growth is still continuing as Figure 1 illustrates. The rapid growth rate started in the early 1980's when Thai government switched its development strategy from import-substituting industrialization to export-oriented industrialization and also by adopting free market mechanism (Glassman, 2010).

This growth is not only restricted in the economic sector. A similar trend can be found also in Human Development Index. Figure 2 illustrates the continuous increase in Thailand's HDI. Even though Thailand's HDI is classified as medium human development- lower than Malaysia- Thailand is preceding its regional neighbors such as the Philippines, Indonesia, Vietnam, Cambodia, Lao People's Republic and Myanmar. Recently, in an effort expand Thailand's influence in South East Asia, Thailand is diligently establishing the diplomatic relationship with their neighbors (Kim et al., 2011; 80). National poverty rate<sup>①</sup> also showed positive improvement as the rate decreased from over 50% in 1986 (Jitsuchon, 2012) down to 20% in 2009. All these positive indications may lead one to conclude that Thailand is developing.

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<sup>①</sup> Poverty Ratio is the percentage of the population living below the national poverty line (World Bank).

However, one alarming question surrounds the optimism in Thailand's economic growth. In 2011, Thailand was classified by the World Bank as an 'upper-middle income country'. In spite of this classification, it is not clear whether Thailand is trapped in the Middle Income Trap or not. The GDP growth data support the doubt of Middle Income Trap theory, as the Thailand's growth rate never exceeded 8% (Jitsuchon, 2012). The growth rate was briefly over 6% during a short period of time after the 1997 financial crisis, but such high growth was never seen in any other occasions. Thailand also failed to advance into the high income category since 1987 when Thailand was categorized as a middle income country (Rigg et al., 2014). Therefore, even with the successful growth in economy in the past, further discussion is needed to evaluate the current and future status of Thailand economy.

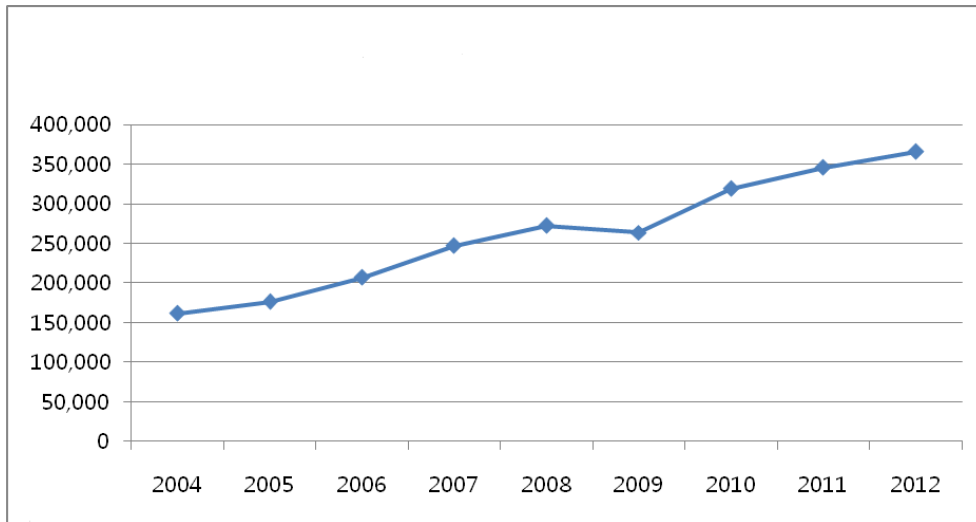


Figure1. GDP trend of Thailand unit: Million Dollar (2013 price)

Source: World Bank (<http://data.worldbank.org/>)

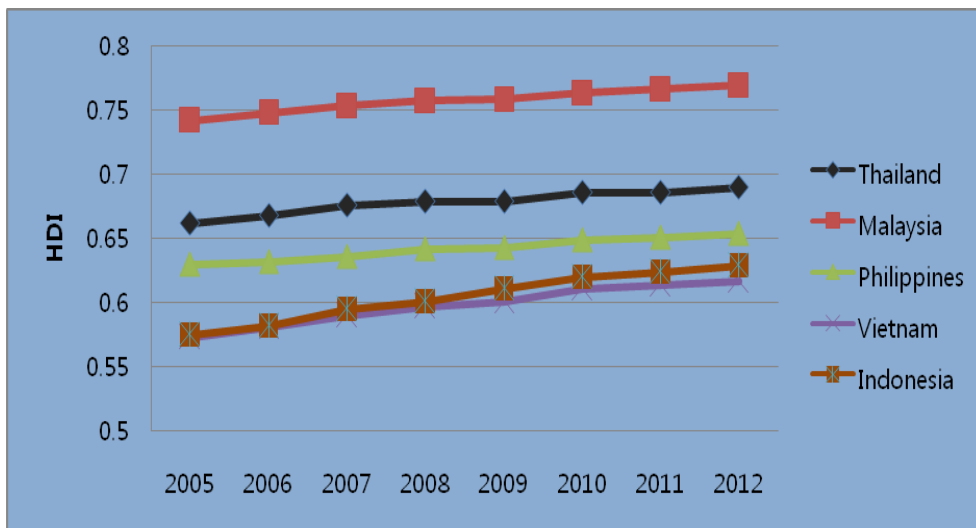


Figure 2. HDI trend of Thai and the Neighbors

Source: UNDP(<http://hdr.undp.org/en/>)

Another factor to include in discussing Thailand's economic development is the regional disparity. As shown in Figure 3, GDP per capita of each region has increased. The data also shows the gap between Bangkok metropolitan area and other regions, especially Northeastern region, is

increasing. In terms of population, Bangkok, the dominant primate city of Thailand, had 8.1 million inhabitants in 2007. This number is about 17 times bigger than the number of residents in Thailand's second largest city. The Thai government has worked to alleviate this inequality; however, the government's effort has yet to show any signs of closing the regional gap (Glassman and Sneddon, 2003; Sakolnakorn et al, 2010). This phenomenon can be termed 'produced poor' or 'unequal poor' (Rigg, 2014) which respectively indicate an outcome of market driven economic growth and relative poverty comparing to rich class or region. If Thailand is indeed trapped in the Middle Income class, the current slow economic growth will make it harder to solve the country's regional disparity.

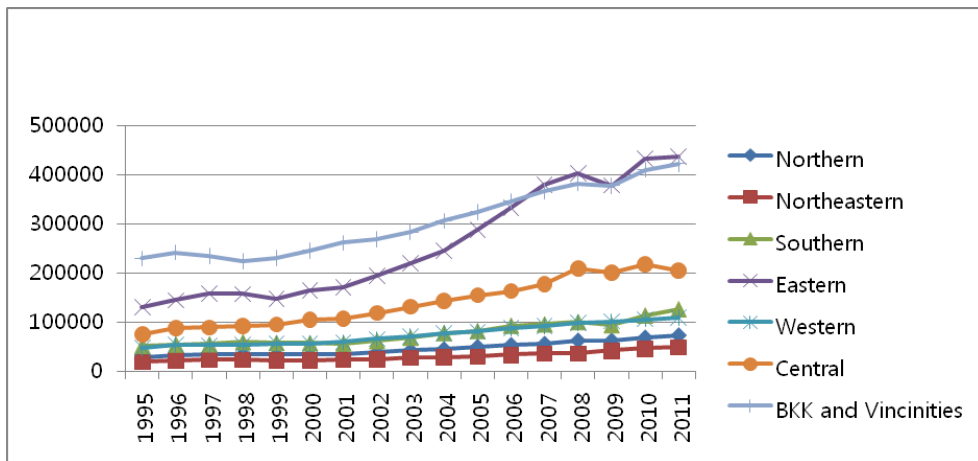


Figure 3. Regional GDP per capita (unit: Baht)

Source: NESDB, <http://eng.nesdb.go.th/>

The objective of this study is to explore how the Middle Income Trap appears in a specific industry and region, and which trajectories are favorable for which region or industry. Since the Middle Income Trap has usually focused on the macro-scale economy (Rigg et al., 2014), this study adopts the regional scale focus on the sugar industry of Thailand informed

by Global Value Chains framework. Even though no clear consensus exists about the Middle Income Trap, this study attempts to apply regional scale analysis and Global Value Chains approach to Middle Income Trap which can provide new implications. Research questions are as below

1. What is the upstream value chain structure of sugar industry in Thailand?
2. What is the governance structure of upstream sugar value chain?
3. Which aspects of the value chain are trapping the upstream sugar value chain?
4. What are the implications for the sugar industry and the region?

## **1.2. Research Methodology**

This study focuses on the upstream sugar value chain with empirical data which are obtained from a field work. Field surveys and interviews have been implemented with actors involved in sugarcane production and marketing activities. The actors include sugarcane farmers, brokers, sugar cane association and milling company members. 33 cane growers, one broker, one branch manager and one growers' association manager are interviewed. The fieldwork is done in Manchakhiri and Khokphochai district of Khon Kaen province.

Additional secondary data are collected and reviewed to support the research. Statistical data are collected from the government authorities and companies. It includes statistic year book and electronic data which are acquired from the internet websites and the individual government officials. Research methodology will be discussed further in later paragraphs.

### **1.3. Organization of the Study**

This study is structured in 6 chapters. The first chapter introduces the background and the objectives of the study. Research methodology and organization of the study are also mentioned in the first chapter. The second chapter, the literature review presents the concept of Global Value Chains and the Middle Income Trap. Additional discussions on the limitations and possible linkage of two concepts are included as well. Next, the third chapter recaps the sugar industry in Thailand, starting with the whole country then proceeding to a narrower focus. Several contextual facts of the Northeastern region are introduced. The fourth chapter presents the upstream value chain structure of sugar. This includes an introduction of the research area, the production of sugar canes, marketing channels of sugar canes and the governance structure of the sugar value chain. The fifth chapter connects the findings from upstream sugar value chain and middle income trap and provides implications. Last, chapter six summarizes the study and draws the conclusion of this research.

Chapter I	<u>Backgounrd</u> and Organization of the Study, Research Methodology
Chapter II	Literature Review: Global Value Chains, The Middle Income Trap
Chapter III	Sugar Industry in Thailand and Northeastern Thailand
Chapter IV	Upstream Sugar Value Chain and Chain Governance
Chapter V	The Middle Income Trap and Value Chain
Chapter VI	Conclusion and Summary of the Study

Figure 4. Organization of the study

Source: Drawn by author



## **II. Literature Review**

### **2.1. Global Value Chains**

The Global Value Chains framework originated from two different bodies of knowledge (Staritz, 2012). One is from Porter (1985) who first used the term ‘Value Chains’ in business studies. According to Porter, each firm has several activities such as design, production, market, deliver and support. These activities compose a ‘chain’ and each chain creates ‘value’. This concept was first applied to a firm level analysis and further applied on a national scale to reveal the competitive advantage of countries (Porter, 1990). Another strand of Global Value Chains approach is rooted from development studies. Hopkins and Wallerstein (1986) argued that value chain is ‘a network of labor and production processes whose end result is a finished commodity’, and this concept was adopted to explain the inequality among the nation states.

#### **2.1.1. Governance**

The Global Value Chains approach originated from developmental approach has been further developed by Gereffi et al.(1994). Gereffi et al. explained that the Global Commodity Chains is a useful framework for investigating the spatial inequalities and allows sub-national level analysis. In Global Commodity Chains, there are four features (Gereffi, 1994). First is an input-output structure. This refers to the every stage from acquiring the raw material to delivering the final products to consumer. The second feature is the territoriality which indicates that the input-output structure results in the spatial distribution of the stages. Third is governance. Firms

within the commodity chain have unequal power and this difference determine the authority and power relationship. The core concept of his first study is that firms have their own source of powers. These powers include upgrading, time and place entry capability, which define the wealth distribution within the chain (Gereffi et al., 1994). These also shape a recognizable dynamics between the actors (Ponte and Sturgeon, 2014).

Unequal power relationships form the governance structure. Here, governance is defined as ‘the inter-firm relationships and institutional mechanisms through which non-market coordination of activities in the chain is achieved’ (Humphrey and Schmitz, 2001). The governance structure was first classified into two distinct types (Gereffi, 1994) : ‘*producer-driven*’ and ‘*buyer driven*’. Figure 5 illustrates the governance structure of each type. The producer-driven type is characterized by a high entry barrier due to the vast capital investment and the advanced technology. Leading firms (usually multi-national corporations) directly control the production process and the parts and component supply. This type of chain is common in industries such as automobile, aircraft and computer (Gereffi, 1999).

On the other hand, the buyer-driven commodity chain is prevalent in an industry with a low entry barrier and a matured technology. Leading firms can easily outsource their production function to independent firms. The competitive advantage of the leading firms lies in the branding, designing and marketing function. The buyer-driven commodity chain can be found from branded manufacturers and large-size retailers. The subcontractors are usually located in developing countries because they can provide low labor cost (Gereffi, 1999).

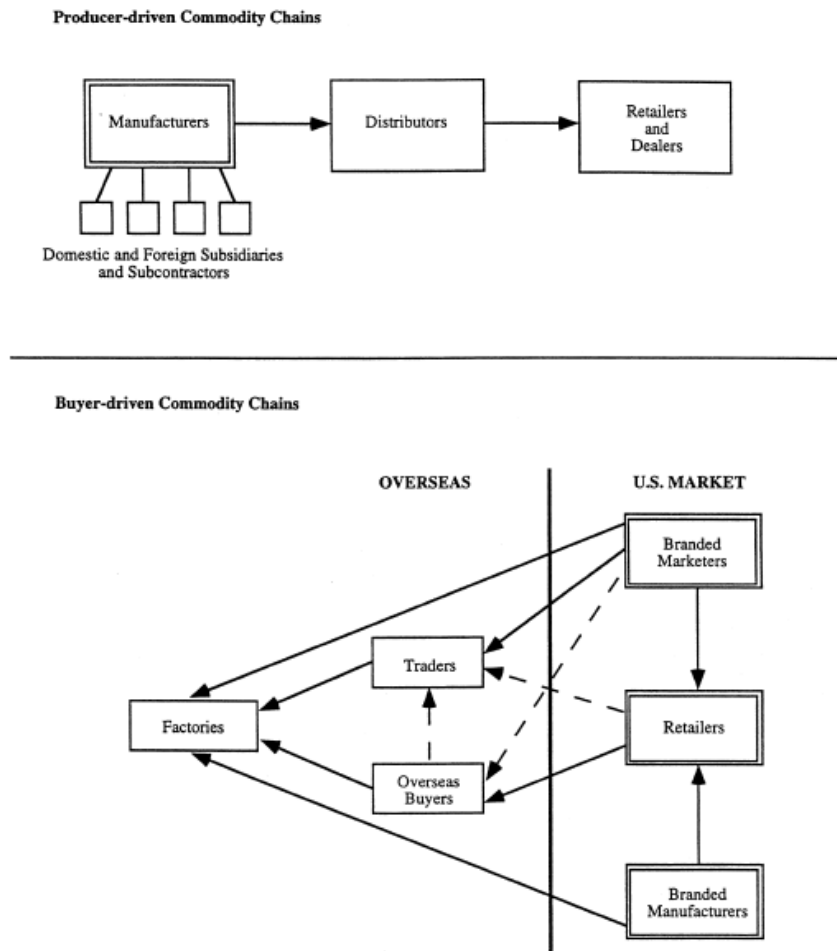


Figure 5. The organization of producer-driven and buyer driven Global Commodity Chains.

Source: Gereffi(1999)

Before proceeding further into the research, the definitions of ‘Global Value Chains’ and ‘Global Commodity Chains’ should be clarified. Classifying the commodity chains just in two categories- Producer-driven or buyer-driven commodity chains- is ambiguous. With the realization of complex nature of Global Commodity Chains, it was further developed into Global Value Chains (Aoyama et al., 2011; 139). Global Value Chains framework introduced more fine distinction between several different types of chain governance structure. Gereffi et al. (2005) introduced three

variables which define the value chain governance and clarified five different types of governance. The variables are as below:

‘A: The complexity of information and knowledge transfer required to sustain a particular transaction, particularly with respect to product and process specifications.

B: The extent to which this information and knowledge can be codified and, therefore, transmitted efficiently and without transaction-specific investment between the parties to the transaction.

C: the capabilities of actual and potential suppliers in relation to the requirements of the transaction.’

Taken these factors into consideration, five possible value chain governance types can be identified. First is the *Markets Value Chains* type. Transactions are easily codified and suppliers have the capability to produce the products. Buyers respond to the price signal and specific coordination is not necessary due to its low complexity of information. The second type is *Modular Value Chains*. Required capability of the suppliers is relatively high. Because the buyers need a specific product, they have to directly control and monitor the suppliers. To ensure the optimal result from this supervision, codified information is exchanged between the buyer and the suppliers. The modular type has clear difference from the markets type as the exchanged information contains more than price signals. The third type is *Relational Value Chains*. Tacit knowledge is exchanged between the buyer and the supplier. The capability of the supplier is high which allows the supplier and buyer relationship mutually dependent. Fourth is *Captive Value Chains* type. This type is utilized when degree of

codification and complexity of production is high and capability of the suppliers is low. Leading firms have to intervene and suppliers bear high switching costs due to their specialization for reaping benefits. Last type is *Hierarchy*. When information cannot be codified and complexity of the product is high, firms are forced to produce in-house which can be described differently than the vertical integration system.

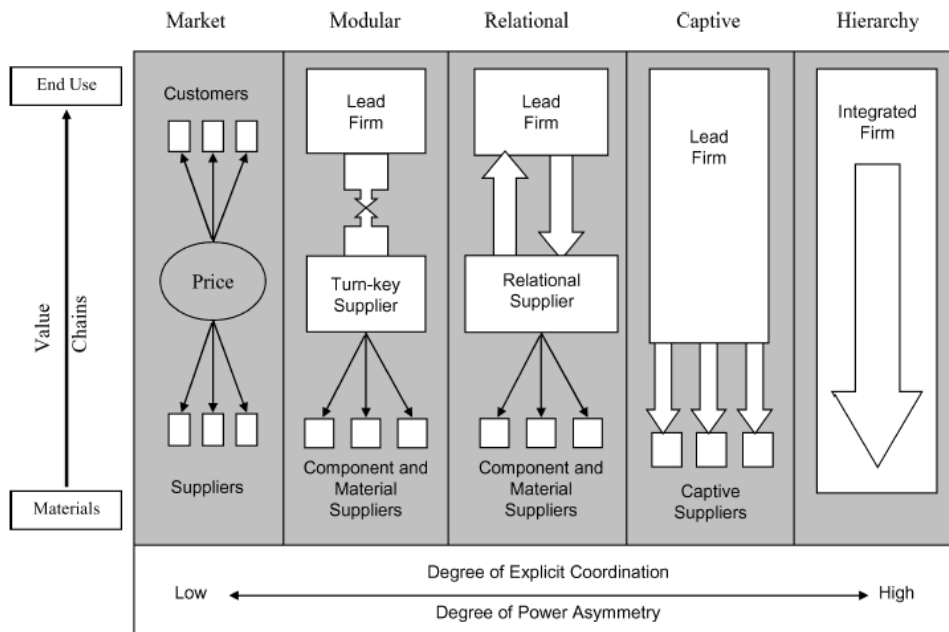


Figure 6. Five global value chain governance types.

Source: Gereffi et al. (2005)

Another classification of value chain governance is suggested by Humphrey and Schmitz (2002). They posed three key questions for the coordination between economic agents to minimize total production cost and transaction cost; 'what is to be produced', 'how is it to be produced' and 'what is physical product flow'. Furthermore, definition of the product and risk (Humphrey and Schmitz, 2000) identify four types of value chain governance. Here, the definition of product refers that when the buyer

defines the product, high level of knowledge exchange is required to encourage the suppliers to produce. Risk refers a loss from non-price factors such as time, quality and standards. *Arm's length market relations* is a type that buyer and suppliers do not develop a close relationship. Suppliers are able to produce the product what the buyers want, and the product is highly standardized which implicates that the buyer and the supplier do not need specific arrangements. *Networks* type is characterized by the mutual dependency. The buyer needs a highly specified product and the supplier has the capacity to meet the need. If the buyer is confident with the supplier's capacity, the buyer and supplier will exchange information intensively which results in a close relationship. This type is similar with the Relational Value Chains. The third type is *Quasi Hierarchy*. One firm exerts high level of control over the other firms in the chain. Information is exchanged between the firms. However the lead firm is not convinced with the capacity of the other firms. To avoid risks, the lead firm maintains the high degree of control. The last type defined by Humphrey and Schmitz is *Hierarchy*. This type shares same characteristics as the Hierarchy type in the five governance types mentioned above. The firm has full ownership of several functions in the chain.

For better specification, Laven (2011) suggested an alternative classification of governance structure to apply to the agricultural value chains. According to Laven's classification, transaction coordination and value chain coordination characterize the governance type. Transaction coordination is about whether transactions are mainly influenced by market force or state involvement. Value chain coordination refers to the degree of integration of agents within the value chain. By applying values such as market or state to transaction coordination concept, and market or integration to value chain governance concept, Laven identifies four types

of governance types. First, when the transactions are coordinated by the government and value chain is coordinated by market force, the type is identified as 'State Governance'. Secondly, the high degree of state involvement and highly integrated value chain are distinct characteristics of 'Joint Governance' type. When transaction and value chain are coordinated by market force, it is the 'Market Governance' type. The last type, 'Corporate Governance' is characterized by the low level of state involvement but with the high level of integration.

Classification of value chain governance structure still may seem inadequate, because in reality, relationships between economic agents are not easy to distinguish. For example, when the degree of information exchange and required capability is low, governance structure would be classified as 'Market' type. However, if the price of the product is directly controlled by the government regulation, the very assumption that actors within the chain respond to the price is violated.

This blurred classification of governance structure, however, does not lead to conclude Global Value Chains framework is useless. In most cases, the classification system allowed Value Chains framework to transform into an analytical tool from a heuristic tool (Kaplinsky, 2000). Before the development of Global Value Chains approach, Value Chains approach was merely descriptive or at best heuristic. Also as the concept chain governance is introduced, even though no clear governance structure is detected, detecting how the chain is functioning through coordination and negotiation became important focus (Stamm, 2004). Because the essence of the focus on governance is that 'it allows us to show quite easily how the form of governance can change as an industry evolves and matures, and indeed how governance patterns within an industry can vary from one stage

or level of the chain to another' (Gereffi, 2013), Global Value Chains approach provides an analytical tool for investigating the dynamics of the value chain.

### **2.1.2. Upgrading**

Even though governance structure of the value chain is important, governance *per se* does not include every aspects of the value chain. While top-down view of the Global Value Chains is governance, bottom-up view is upgrading (Cattaneo et al., 2010; Gereffi, 2013). Upgrading and governance are not separated concepts in Global Value Chains framework. As mentioned above, governance structure is not static but dynamic. And this transformation from one governance type to another is possible by 'upgrading' (Parrilli et al., 2013).

Simply there are four types of upgrading within the value chain (Humphrey and Schmitz, 2002; Gereffi et al., 2001).

- *Process Upgrading*: the inputs and outputs structure can be more efficient. This is attained by a new technology or a production system. If production cost is reduced, additional value will occur.
- *Product Upgrading*: Firms can produce more sophisticated product. If the new product is not characterized by higher unit value, it is not upgrading.
- *Functional Upgrading*: This type of upgrading is available when the firm can move into another stage within the value chain. For example, in the case of buyer-driven governance type, if a subcontractor moves their position from manufacturing to more value adding position such as



designing or branding, they can reap more profits than before.

- *Inter-sectoral upgrading*: A firm in the value chain can find their new business area. For example, a television manufacturer can utilize their capability to produce computer monitors.

The main argument in the upgrading concept is how each agent can successfully accomplish ‘upgrading’ (Gereffi, 2013). A simple answer to this question is that firms increase their capability by exchanging knowledge through the linkage with the lead firms in the global market (Gereffi, 1999). This way of upgrading is a common practice in the global apparel value chain. Gereffi(1999) argues, ex-apparel manufacturing countries such as Hong Kong, South Korea and Taiwan accumulated knowledge through their linkage to global market. Then, they were able to move their position by subcontracting to Chinese companies and concentrating on more value-adding activities.

More systematic approach to the way of upgrading is introduced by Humphrey and Schmitz (2002). As introduced above, they classified governance type into four; *Arm’s length market relations*, *Networks*, *Quasi hierarchy* and *Hierarchy*. In Quasi hierarchy type, they conclude that upgrading is not easy. Suppliers are eager to move their position to branding, designing and marketing. However, lead firms are reluctant to this transition, because lead firms want to maintain their key activities which generate much more profit than manufacturing. Under this unfavorable condition, suppliers have several options. They use their knowledge acquired from the lead firm and find a new buyer or suppliers to move into new functions which the lead firms are willing to cut down.

In their other research (Humphrey and Schmitz, 2000), upgrading in Arm's length market relation and Networks type are introduced. In Arm's length market relation, it is easier to upgrade, but firms are required to have high-level of capability. If they are competitive, upgrading is possible by measures such as participating in a trade fair. In the Networks case, upgrading is not easy. This is because the firms are already competitive and industry itself is mature; thus, knowledge exchange is relatively scarce.

Even though there are several cases of successful upgrading trajectories, firms cannot expect upgrading to be an automatic process. In this perspective, Kaplinsky et al.(2011) introduces the case of the Gabon timer and Thai Cassava value chain. As the importance of South market especially China (Gereffi, 2013; Cattaneo et al., 2010) is increasing, the economic geography of many value chains have extensively changed (Kaplinsky and Farooki, 2010). It was the same case in the Timber and the Cassava value chain. Because China has a competitive advantage in cheap labor, labor intensive activities within the timber and cassava value chain were transferred to China. This finally resulted in more export of unprocessed cassava and timber from Thai and Gabon to China. The consequence of this 'technical downgrading' is still not clear. However, it is obvious that result of participating in the value chain is different not always upgrading.

Sometimes, upgrading is not preferable for the participants in the value chain. One good example of this is South African Wine industry (Ponte and Ewert, 2009). Product upgrading did not result in higher value adding, and downgrading was participant's strategy to reap more benefits. This example illustrates that the outcome is important rather than the normative upgrading trajectory, and the detailed study to reveal the dynamics of specific value chain is needed (Ponte and Ewert, 2009).

### **2.1.3. Development and Value Chains**

Several literatures point out Global Value Chains is related with developing country's firms (Staritz and Morris, 2011; Gereffi et al., 2001; Kaplinsky 2000; Helmsing and Sietze Vellema, 2011). This is because the division of labor is occurring between the developing country firms and the transnational corporations while they coordinate closely (Gereffi et al., 2005). As the Global Value Chain framework is focusing on developing county, there are efforts to reveal implications from Global Value Chain for development issues, because upgrading itself does not indicate development.

Staritz(2012), offers four dimensions for Global Value Chains and development. First is market access and upgrading. Increased accessibility to market will attract diverse participants in the value chain. The linkage between these participants will enable upgrading. Second is poverty reduction, which indicates the participation of the poor is essential for development. Next is market based support service. For development, intervention into value chain should not focus on individuals but on the comprehensive entity. Fourth is involvement of lead firms. This is obvious because lead firms have higher possibility of upgrading.

Even though these four dimensions may provide important implications for development, still it is normative. Some claims that no satisfactory answer can be presented to the economic development issue in terms of Global Value Chains framework (Stamm, 2004). Therefore, the focus on a specific economic activity in regional level is useful, because the regional level analysis is required to deal with development issues (Van Helvoirt, 2009; 52). As the Global Value Chains framework started from the question

‘why specific economic activities are geographically distributed’ (Gereffi, 1994; Gereffi, 1999; Leslie and Reimer, 1999), focusing on small region and industry would be favorable for studying development issues.

With the greater proportion regional economy dedicated to agriculture, the focus is moved to agriculture. Usually, development issues are confined to manufacturing or service sectors which are rare industries in rural areas. This provides a need for an interest on rural development. In the rural context, agricultural value chains are not analytically different from other type of value chains (Pegler et al., 2011). For rural development, there are several literatures pointing out that cooperation is the key factor (Monnereau and Helmsing, 2011; Bijman et al., 2011; Marsden et al., 2000). This coordination is not only confined to high frequency of transactions but high level of inter- dependence relationship between the suppliers and buyers. Also not to alienate rural context, as UNRISD(2010) states that employment is crucial for development, the employment creation is important for the development of underdeveloped rural areas.

## **2.2. The Middle Income Trap**

### **2.2.1. What is the Middle Income Trap?**

What is the Middle Income Trap? The middle Income Trap was first introduced by Gill and Kharas (2007; 18-19). They found that some Latin American countries could easily shift their position from the low income to the middle income category by extracting their natural resources, but they failed to advance to the high income status. The same study was conducted with Asian countries. Gill and Kharas concluded that these countries should improve their economic structures by three transformations; specialization rather than diversification, innovation than investment and establishment of a better education system.

In a literally sense, Middle Income Trap refers to ‘a situation in which a middle income country falls into economic stagnation and becomes unable to advance its economy to a high-income level for certain reasons specific to middle income countries’ (Egawa, 2013; Warr, 2011). Still, no clear consensus agreed on the exact definition of the Middle Income Trap. It is even debatable whether the trap itself exists or not; however, the term ‘Middle Income Trap’ is widely adopted to explain the economic slowdown of developing countries (Rigg et al., 2014).

Several different scholars have suggested explanations behind the Middle Income Trap. According to Yusuf and Nabeshima (2009), lower rates of investment, low rates of total factor productivity, and low levels of innovations are three indicators of the Middle Income Trap. In another perspective, Kharas and Kholi (2011) explain some middle income countries suffer from the phenomenon because they no longer have the advantage of

the low labor cost. Also these countries are unable to compete in skill-intensive industries due to the lack of highly skilled labor force, which results in the double-side pressure. Eichengreen et al. (2013) utilized a quantitative method to reveal the Middle Income Trap. According to the study, a high level of human capital, high share of high-tech exports and a financial stability are critical variables of the Middle Income Trap while investment ratio is negatively correlated with the economic growth. They suggest because primary level education is statistically insignificant, there is a need for better education for high level of human capital. The need of a sufficient human capital is also mentioned by Ravenhill (2014) who insists that the labor shortage is the most significant obstacle to the ‘trapped’ countries.

As Kharas and Kholi(2011) suggested, income inequality is a probable reason of the Middle Income Trap. This question was again raised by Egawa(2013). By analyzing statistical data, Egawa(2013) concludes that income inequality is positively correlated with an economic slowdown. Here, income inequality is not merely indicating individual income inequality. Egawa insists that income inequality in individual level is caused by regional disparity and suggests that public policies for rural development are important in escaping from the Middle Income Trap.

From the different researches about the Middle Income Trap, we can find that explanations of the trap are somewhat conflicting. The advancement to skill-intensive industry and higher human capital are related to each other and accepted as important factors of escaping from the Middle Income Trap. However, in terms of investment, it is not clear whether the investment is important or not. Thus, the disparity between the definitions calls for more specific study on each country.

### 2.2.2. Middle income trap in Thailand

As mentioned in the introduction, Thailand's economic growth has been impressive and is still continuing. However, it is still doubtful Thailand would advance from middle income status to high income status. This doubt can be justified by the trend of GDP growth rate. As illustrated in Figure 7, it is obvious that growth rate has been slowing down since the early 1990's.

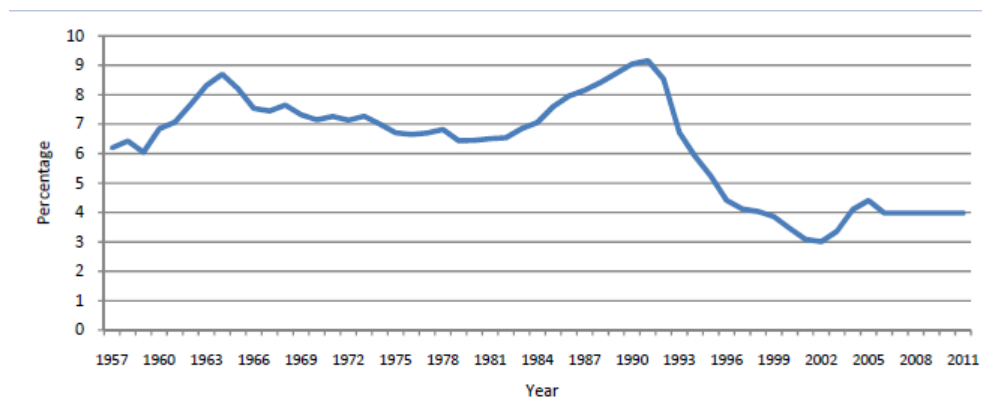


Figure 7. Medium Term Growth Rates from 1950 to 2011<sup>②</sup>

Source: Jitsuchon(2012)

Jitsuchon (2012) interprets, this slowdown trend started around the mid 90's and it is a proof of the Middle Income Trap. He insists that the old model of development; cheap labors, technological acquisition through importation are not available anymore to Thailand. Jitsuchon gives a several different reasons why the old model of development is not applicable any more.

- Labor shortage. Unlike other countries that enjoyed the advantage of an

<sup>②</sup> Moving average is a statistical method to calculate trend of the data.

abundant labor force, Thailand has suffered from the shortage of low-skilled labor as well as high-skilled labor. Until now, this problem has been mainly solved by foreign workers. This pattern is no longer reliable because the economic growth of neighboring countries will encourage the workers to remain in their home country. Also, as foreign workers are mainly unskilled, they cannot contribute to the shift from labor intensive to skill intensive industry.

- Incomplete Market in skill training. In the public sector, the skill training is inadequate for the low-skill workers who are seeking to meet the market requirements. However, high-skilled workers are relatively in a better situation because private firms run their own training program.

- Education. Thailand's education system is unsuccessful in producing high level of human capital. According to Warr (2011), this is not a problem of number of students enrolled in university, but the real problem lies in the need of an extensive reform from the primary education level.

- Low level of research and development activities and spending. Proportion of R&D spending to total GDP has stalled in 0.2% level. Private sector could improve their managerial or logistical practices, but still it is inadequate. Low R&D is also mentioned by Suehiro and Wailardsak (2014). They argue this is leading to low level of innovation which is important to escape from the Middle Income Trap.

- Spurring growth by natural resources. As Latin American countries already experienced (Gill et al., 2007), natural resources will deplete soon. In terms of sustainable development, natural resource-driven growth is unfavorable.



- Increased difficulty of maintaining macroeconomic stability. Under the flexible exchange rate system, stability is guaranteed by credulity and independence of the banks. However, Thailand's political environment is making it unstable.
- Fiscal structure of Thailand. The Thai government is collecting much less tax than the international standard tax rate. This results in a shortage of government resource which should be invested for infrastructure.
- Monopoly. The level of monopoly is higher in high value industries. The lack of competition is hindering an incentive for better performance.
- Clear distinction between big firms and small or medium firms. The majority of firms are small or medium size, which is unfavorable to competition in global market.

In addition to these reasons of falling in the Middle Income Trap, Jitsuchon says the institutional weakness is the most important factor. There is no political will to promote innovation. This coincides with Warr (2011). Warr insists that Thailand's political map is moving to populism since the early 2000's. Policies are targeting specific interest groups without serious considerations of the consequences. Politicians are only looking on short-term benefits (usually more votes) which can be interpreted as same as Jitsuchon's diagnosis.

Several measures are suggested for escaping from the Middle Income Trap. Warr (2011) suggests politicians need a long-term view on the economy. Politicians should approach systematically to escape from the trap. On the other hand, Jitsuchon(2012) argues innovation friendly

policies, improvement of human and physical capital, making a right incentive system are essential. Here, the right incentive system indicates good institutions which properly connect the interest of individuals and the overall economy.

### **2.3. Conceptual Framework for empirical analysis**

Until now, most literatures about the Middle Income Trap focused on national level. This is perhaps because scholars started to wonder why some 'countries' are showing stagnated growth. However, as the Middle Income Trap is not comprehensively defined, there are possibilities to scrutinize the trap in different scale (Rigg et al., 2014).

Rigg et al.(2014) narrowed their focus on micro level and individualized the Middle Income Trap. They found that individuals in Northeastern Thailand learned specific skills when they were working as a migrant worker. However, after they came back to their home town, acquired skills were impossible to be applied there, because of the mismatch between the acquired skill and the required skill. Their conclusion is that this mismatch hindered any type of knowledge exchange and kept them in the low-skill level which indicates the life trajectory of individuals are related with the Middle Income Trap.

In another case, the Middle Income Trap is analyzed in city-scale level. Yusuf and Nabeshima (2009) implemented a research about middle income trap in the city of Penang. They concluded that Penang is not large enough to achieve the scale of economy. The lack of a lead firm also results in the lack of resource for innovation, consequentially trapping the city in the middle income. Similar to other studies, the way of escaping from the trap

is upgrading by more effort in research and development.

Goto and Endo (2014) applied the Middle Income Trap to the garment industry of Thailand. They argue that the garment industry could have led the economic development of Thailand; however, now it is trapped in the middle by low productivity and the involvement in the lower value added functions. To internalize innovation capacities, Goto and Endo suggest refocusing on the local market can be a key of upgrading. This is because local suppliers can easily comprehend the local context and be independent from global players.

According to these discussions, it is possible to conclude that interpreting the Middle Income Trap is not only about the country but can derive implications from diverse levels. Thus, in this research, I suggest that regional-industrial level analysis is a possible way of revealing the Middle Income Trap. Then how is the Middle Income Trap related with Global Value Chains? As the Middle Income Trap is a status which indicates stagnation in middle income level, it can be interpreted as stagnation in the value chain and escaping from the trap is possible by 'upgrading' (Ohno, 2009). Therefore, interpreting the Middle Income Trap by Value Chains perspective is another way of revealing the trap.

As every value chains has any degree of governance (Kaplinsky, 2000) an industry in specific region will have its own governance structure (Gereffi et al., 2005). In this governance structure, there can be any form of linkage between the industry and the Middle Income Trap which is prevalent in Thailand. Under the existing value chain, the relationship between the buyers and suppliers characterize the features of the Middle Income Trap. In this study, knowledge exchange, labor issue and

institutional context which are provided by Jitsuchon (2012) and Tran (2013) as an analytical framework for the Middle Income Trap will be mainly studied. Then, possible upgrading trajectories and implications for development especially on rural base can be drawn. It should be clearly explained that Global Value Chains approach is not only confined to global firms, it is also applicable to regional network or firms (Helvoirt, 2009; 51)

Especially, as Northeastern Thailand is economically lagging behind other regions, focusing on this region will be more implicative because regional disparity is one characteristic of the Middle Income Trap. As mentioned above, agricultural value chain is not analytically different with other value chains, thus I focus on the sugar industry which is one of the main agricultural industries in Thailand. The focus is limited to the upstream sugar value chain as upstream activities which are geographically assembled in rural areas.

# III. Sugar Industry in Thailand and Northeastern

## 3.1. Sugar Industry in Thailand

Thailand is one of the leading countries in the sugar industry. As illustrated in Figure 8 and Figure 9, in terms of sugar production, Thailand is the fourth biggest producer and the second biggest exporter of refined sugar. Sugar cane is a crop which is harvested from the farm and, refined sugar is a product yielded after processing sugar canes. Sugar is also important in Thailand as well as their position in the global market. In Thailand, sugar cane has the highest volume produced and is the third most valuable crop in terms of value production after rice and rubber. The importance of sugar is also recognized by the Thai government. The Thai government regards sugar as an essential commodity and controls production and marketing of sugar (Chiadamrong and Kawtummachai, 2008). To understand the importance of sugar, the history of sugar cultivation in Thailand should be mentioned.

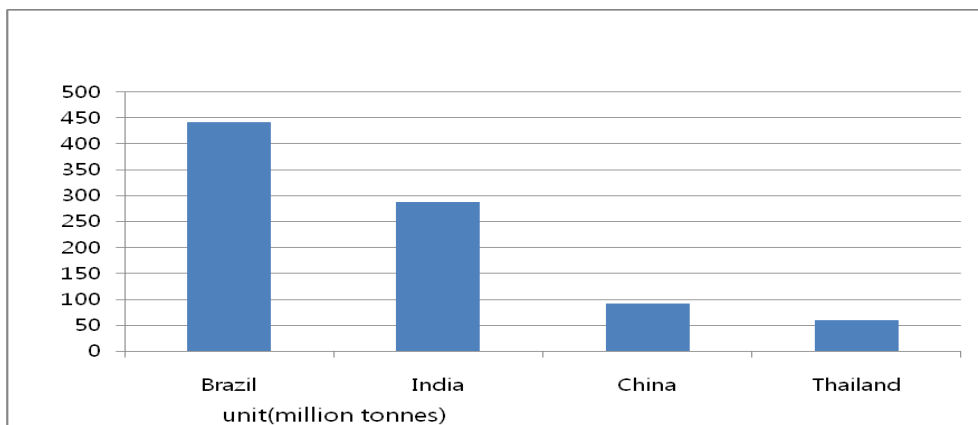


Figure 8. Top 4 sugar cane producers Source: FAO STAT(2011)

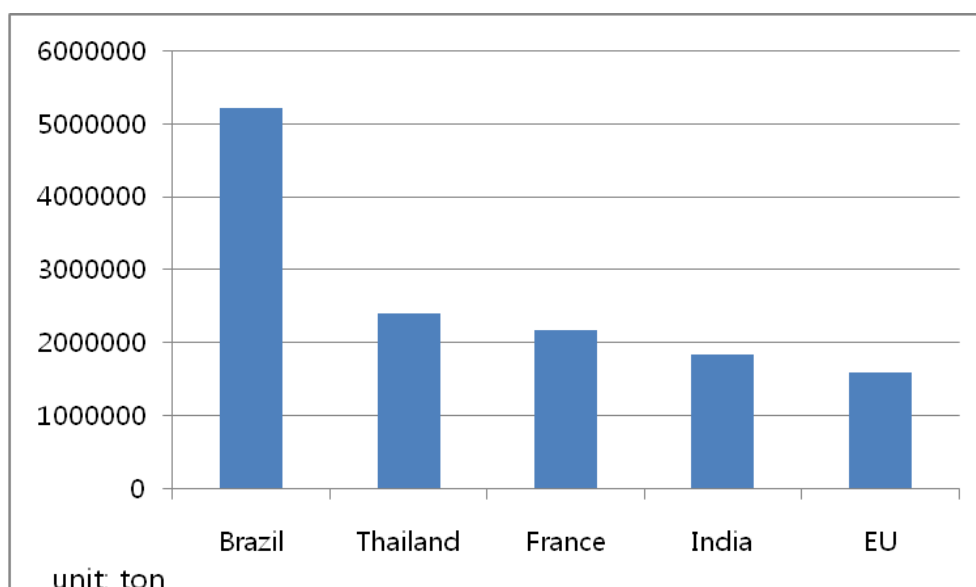


Figure 9. Top 5 refined sugar exporters

Source: FAO STAT(2011)

	2011	2012	2013
<b>Trade Amount</b>	54.7	55.7	56.56
<b>World Market share</b>	12.14%	14.18%	12.38%
<b>Domestic Consumption</b>	2.35	2.46	2.5

Table 1. Thai sugar in World market Unit: Million ton

Source: Office of Cane and Sugar Board

### 3.1.1. History of the sugar industry in Thailand

Sugar cane cultivation in Thailand has a long history, since Sukhothai Kingdom era. However, sugar cultivation had not expanded for a long time before 1937. It was mainly for domestic consumption and, at times, Thailand even had to import sugar from other countries. Between 1930 and

1935, the total production of sugar was 40,000 tons while 25,000 tons were imported from Java, Indonesia (Ekasingh et al., 2007; 81). The year 1937 was a new starting point for sugar industry. In 1937, modern style sugar mill was first established. Until this time, sugar was mainly produced for domestic use. This is because of the import substitution strategy of Thai government (Ekasingh et al., 2007; 81).

After the World War II, imported sugar flooded into Thailand. Because the Thai government was implementing the import substitution strategy, the sugar industry was also promoted by government. A greater investment and technological improvements resulted in protecting property right (Doner and Ramsay, 2004). Finally, in 1960 Thailand became an exporter of sugar. As sugar was once regarded as a lucrative cash crop, many farmers and millers got involved in the business. Also farmers and millers started conflict for more proportion of the profit from the sales of sugar. In this stage, millers were better organized so they could attain advantageous position (Doner and Ramsay, 2004).

Even as the capacity of the mills rapidly expanded, still the supply of sugar could not meet the demand of the international market. To meet the global demand, millers further expanded their sugar crushing capacity. Then, to maintain the favorable price level, the Thai government imposed quota to millers. Under this quota, millers focused on increasing the efficiency because producing the additional amount over the quota was prohibited, so their expanded capacity would not be fully utilized. Besides, the conflict between millers and sugar cane growers was not solved because millers could easily deceive growers as the regular farmers did not have enough information.

As the millers could not use their full production capacity, they needed a precise purchasing schedule to produce efficiently. Millers started to contract middlemen who can supply a vast amount of sugar canes. This interest-driven relationship shifted the power between growers and millers (Doner and Ramsay, 2004). Finally growers could establish their own association. Because growers could raise their own voice, the conflict became intense. During the 1975-1976 harvest season, the Thai government had to directly intervene.

In 1984, to solve the conflict between the sugar millers and cane growers, the Cane and Sugar Act was passed. To mediate the stakeholders, the Office of Cane and Sugar Board (OCSB) was established and representatives from government, mills, and growers (association) became the member. The OCSB took the responsibility of setting the price. The Thai Cane and Sugar Trading Corporation was also founded to protect the interests of all parties. Its main activity was deciding the price of exported sugar. Due to the 1984 Cane and Sugar Act, the conflict was resolved. Doner and Ramsay(2004) say this was a ‘institutional innovation’. Even though 1984 act has been legislated long time ago, the initial draft only went through minor modifications except putting value on quality of sugar canes.

### **3.1.2. Sugar value chain in Thailand**

Sugar value chain simply consist of growing sugar canes, harvesting the canes, transporting the canes, milling, transporting sugar and finally selling the refined sugar in the market(Higgins et al., 2007). In Thailand, planting sugar canes starts around October. Because October is the end of the rain season, soils have a high moisture level which is favorable for growing sugar canes. Especially the growers in Northeastern Thailand mainly start



planting in October as their field is rain-fed without the adequate irrigation system (Arjchariyaartong, 2006).

One special characteristic of sugar cane is that seeds are not planted in the soil. Grown-up sugarcanes are cut into several strands and it is horizontally planted. Farmers can use planter machinery or plant by hand. After these strands are grown, farmers do not root up the whole cane but cut and leave ratoons. These ratoons again grow and can be harvested again. Due to this characteristic, the initial investment is relatively high because of purchasing the strands. In general, farmers harvest 2 or 3 times from same ratoon. Harvesting more than 3 times is possible but it results in a lower sugar content. Doner and Ramsay (2004) point out that because sugar canes are not grown from seeds, there is a low incentive for developing a new variety of canes.

Usually after around 10 to 12 months of growing the canes, it is ripen, ready to be harvested. When farmers harvest the canes, they can set them on fire. When the fire catches on, leaves are burnt but the main part is not. The loss of moisture level is a disadvantage but sometimes burning the field is adopted because farmers can harvest the canes faster. Farmers have two options for harvesting as well as planting; harvesting machinery or by hand. When canes are cut, the bottom part is left as described above. Top part also can be cut, and this depends on the harvester's decision. If the top part is remained, weight of the canes increase but inversely sugar content decrease.

Transporting a cane is the most important stage of sugar value chain due to the sugar cane's high rate of spoilage (Chiadamrong and Kawtummachai, 2008). This is the most critical reason why growers and millers need to cooperate at an intimate level (Doner, 2009; 145). If a cut sugar cane is

exposed to the open air even only for one day, 5-10% of moisture evaporates and 1-2% of sugar content is decreased. So, the precise schedule of harvesting and transporting is a critical factor in creating better efficiency. Additionally, due to sugar cane's high rate of spoilage, weighing stations where canes are traded and farmlands are geographically congregated to minimize traveling.

Canes are transported to the mills, and go through a several procedures to be transformed into sugar. First, canes are washed to get rid of dirt and then cut into pieces. Cut pieces are crushed. On the next step, juice is extracted from the pulps. After several steps to remove any residuals, sugar juice is evaporated in the vacuum pan then juice is finally crystallized. In the last sugar season (2012/2013), from 1000kg of raw sugar cane 106kg of sugar was produced.<sup>③</sup>

There are several institutional arrangements for trading canes between the growers and millers, and selling sugar to domestic and international markets. First of all, according to the 1984 Cane and Sugar Act, 70% of the profit from sugar is distributed to the sugar cane growers while 30% go to the millers. To guarantee this allocation, the OCSB set the price of sugar. Before the planting season, the OCSB announces the first price by considering the global sugar price, initial capital investment, exchange rate and the total production. According to the price of sugar, price of the sugar canes is also decided because 70% of the profit is supposed to belong to the growers. When growers sell their canes to the millers or brokers, farmers first receive the first price.

The second price is announced after the actual sugar production ends.

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<sup>③</sup> Source: Office of Cane and Sugar Board

The second price reflects same factors as the first price's, and representatives of millers and farmers participate in this process. However, due to a fluctuation of exchange rate and sugar cane yield, the second price is not the same as the first price. If the first price is lower than the second price, growers receive the differentials. Usually the first price is lower than the second price because the OCSB estimates the first price conservatively. If the first price is higher than the second price, only millers receive compensation from the Cane and Sugar Fund(CSF).

Here, the price set by the OCSB is weight based. When the farmers deliver their raw canes, it is weighted and they receive money according to the total weight of canes. Before the 1993/1994 sugar season, canes were only priced by weight which discouraged the overall quality improvement. To solve this problem the Commercial Cane Sugar (CCS) is introduced. According to this rule, the price of sugar canes is based on 60% of weight and 40% of sugar content. Sugar content is measured at the factory, so the farmers cannot know the result when they sell their canes. However, from the field work results, the price depended on the sweetness level consists much lower than 40% of the total price.

If a grower wants to receive the price differentials and additional profit from the CCS, they should register for a quota. As mentioned above, government allocates the quota to each mill. Then mills contract with farmers and allocate the set amount of sugar canes to meet their sugar production quota. Registered growers are then considered official sugar cane growers. The growers can put out amount of canes exceeding the quota through purchasing canes from others. Also a broker can register for a quota and mediate farmers and mills. These registered agents can only receive benefits from profit sharing and the CCS. Other growers who do not

have a quota can freely sell their cane to anyone but cannot obtain any benefits from the OCSB.

Between the seller and the buyer of sugar canes, there are 27 Associations of Sugar Cane Farmers. If a cane grower has an official quota, he can be a member of the association. However, they are not obligated to be a member. Associations take care of the members and assist in negotiating the price. Also they supervise measuring the CCS. Associations are independent from the government and make efforts to aid sugar cane growers. However, there are several requirements to establish and retain the association. The association has to have at least 600 members and the total sugarcane production from its members should be 600 tons. If the members of the association acquire a quota up to 55% of a single mill, 1% of the mill's total profit is paid as a commission to the association. With this commission, associations can hire staff and help the growers.

After sugar is refined from the mill, marketing sugar is also under a quota system. There are three types of quota for produced sugar. Quota A is for the domestic market. It is allocated to each mill based on their total capacity before the new sugar season starts. Sugar for quota A is sold from millers to official wholesalers and the price of quota A sugar is fixed by the OCSB. Quota B is for the international market. Quota B sugar is traded on behalf of the Thailand Cane and Sugar Corporation (TCSB). Price for quota B sugar is set by the TCSB. Lastly, quota C represents a surplus of exportable sugar. If mills meet the amount of quota A and B, sugar can be freely traded by the millers. The price should not be lower than quota B to guarantee the profit for growers. In 2012/13 sugar season, quota A was 2.6 million tons, B 800,000 tons and C 6.6 million tons.

Allocation of quota to the millers is annually implemented. To encourage mills to produce as much as they can, the OCSB distribute more quotas to mills that had more quota C amount. And to promote export by gaining the price advantage, the domestic sugar price is higher than the export sugar price. Domestic consumers also cannot buy more than 20kg of sugar each time. This is sort of a tax to promote the sugar industry (Doner and Ramsay, 2004) and why sugar is regarded as the most heavily protected agricultural industry in Thailand (Warr, 2008).

<b>Production Year</b>	<b>Quota A</b>	<b>Quota B</b>	<b>Quota C</b>
1983/84	650,000	611,450	901,078
<b>1984/85</b>	700,000	600,000	1,171,401
<b>1985/86</b>	650,000	630,000	1,211,343
<b>1986/87</b>	702,926	630,000	1,202,271
<b>1987/88</b>	790,000	600,000	1,201,288
<b>1988/89</b>	840,000	600,000	2,461,637
<b>1989/90</b>	980,000	600,000	1,769,109
<b>1990/91</b>	1,080,000	600,000	2,162,922
<b>1991/92</b>	1,210,000	600,000	3,073,845
<b>1992/93</b>	1,280,000	800,000	1,537,848
<b>1993/94</b>	1,325,000	800,000	1,679,945
<b>1994/95</b>	1,500,000	800,000	2,968,890
<b>1995/96</b>	1,650,000	800,000	3,543,518
<b>1996/97</b>	1,670,000	800,000	3,346,476
<b>1997/98</b>	1,700,000	800,000	1,594,494
<b>1998/99</b>	1,750,000	800,000	2,642,339
<b>1999/00</b>	1,650,000	800,000	3,070,081
<b>2000/01</b>	1,700,000	800,000	2,488,030

Table 2. Sugar quotas in Thailand

Source: Arjchariyaartong (2006)

### **3.1.3. Problems of sugar industry in Thailand**

Thailand could successfully promote sugar industry for several reasons. Governments effort functioned well which resulted in the institutional innovation. Cheap labor force was suitable for labor-intensive sugar cane farming and the abundance of arable land have encouraged the expansion of sugar cane fields (Doner and Ramsay, 2004; Arichariyaartong, 2006; Naranong, 2000; Ekasingh et al., 2007). Also, the WTO had banned the EU intervention to sugar beet which resulted in high sugar price. Due to these reasons, Thailand could be one of the leading countries in the sugar industry.

However, the continued success in the sugar industry is now facing various challenges. Quota and profit sharing system have been implemented to satisfy both growers and millers but it also functions as the measurements to stabilize the output level (Naranong, 2000). As this fact implicates, the output of sugar cane is highly vulnerable. Sugarcane is no exemption from the other crops as the output depends on the weather condition. The fluctuation of the output can be stabilized by the irrigation system, but in Thailand, the poor irrigation system is resulting in high dependence on the natural rainfalls (Arichariyaartong, 2006). Also the price fluctuation in the global sugar market is becoming problematic. Before the 1997 financial crisis, Thailand could have stabilized the price fluctuation by controlling the domestic price. However, after the crisis, floating exchange rate undermined the Thai government's ability to balance the price and the whole sugar industry faced vulnerability (NaRanong, 2013).

In addition, the available arable land is almost fully used for crop

cultivation, and further expansion of sugar cane field is resulting in deforestation and low output from marginal lands (Naranong, 2000). This indicates that the abundance of arable land is not an advantage anymore in the Thai sugar industry. Also utilizing cheap labor cost is not favorable (Doner and Ramsay, 2004). This would be a bigger problem in 2013 as the Thai government increased the daily minimum wage to 300 baht.

Poor time scheduling and infrastructure still decrease the efficiency of logistics (Chiadamrong and Kawtummachai, 2008). A new variety of strands and better practice are not introduced because of a low level of research and development activities (Doner and Ramsay, 2004). Machineries that can save labor cost in harvesting and plating are only utilized by big plantations (Arichariyaatrang, 2006) which results in the low productivity for smallholders.

Now major sugar producers such as Brazil and Australia are improving their productivity by adopting new technologies, and Vietnam is producing sugar by taking advantage of their cheap and abundant labor force (Doner and Ramsay, 2004). This trend has been evident since 1990's (Doner, 2009; 161) Thus, the sugar industry in Thailand is trapped in the middle as they cannot compete with Brazil and Australia in terms of high efficiency thanks to the technological advancement. At the same time, Thailand cannot compete with countries with cheap labor cost due to Thailand's relatively higher labor cost. It is clearly illustrated in Table 3 which shows that the yield of cane per rai and yield of sugar per rai is lower than Australia and even the Philippines. In 2009/10, 2010/11 and 2011/12 sugar season, the yield per ton of sugar cane was 101 kg, 101 kg, 104 kg<sup>④</sup> while it was 95 kg in 1990/1991 season according to Table 3.

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<sup>④</sup> Source: Thailand sugar annual 2013



	Yield of Cane/Rai (tons)		Yield of Sugar/Rai (tons)	
	1983-1984	1990-1991	1983-1984	1990-1991
<b>Thailand</b>	6.5	7.66	0.68	0.73
<b>Australia</b>	12.6	11.86	1.65	1.79
<b>Philippines</b>	8.25	12.66	0.77	1.18

Table 3. Comparison of Sugarcane Yields<sup>⑤</sup>

Source: Doner and Ramsay (2004)

This double-side pressure and the problems described above are making the future of Thai sugar industry doubtful. As the first statement of the Middle Income Trap originated from the countries that cannot enjoy competitive advantage from labor and natural resource, Thailand's sugar industry is one of the clearest evidence of the Middle Income Trap in Thailand. More specific discussions of the industry will be dealt in chapter 5.

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<sup>⑤</sup> Rai is a unit of land size. 1 rai is 1600m<sup>2</sup>(40m\*40m)

## **3.2. Northeastern Thailand and Sugar**

### **3.2.1. Regional disparity and Northeastern Thailand**

Thailand can be divided into six regions; Bangkok Capital Area, Central, Eastern, Southern, Northern and Northeastern. As iterated in the introduction, the gap between the Capital Area and other regions are widening. Due to this regional disparity, Thailand is even referred as ‘newly industrialized city’ not ‘newly industrialized country’ (Parnwell and Arghiros, 1996).



Figure 10. Six regions of Thailand

Source: modified from [en.wikipedia.org](https://en.wikipedia.org)

Especially Northeastern Thailand is the most problematic region in terms of regional disparity. GDP per capita of capital area was 422,141 baht in 2011 while Northeastern was 48,589 baht. It is also lower than other regions except the capital area. Other regions' GDP per capita was; Northern 72,925 baht, Southern 125,270 baht, Eastern 436,479 baht and Central 204,166 baht.<sup>⑥</sup> The main industry in Northeastern Thailand is agriculture while Southern and Northern regions are benefiting from natural resources and tourism, and Central and Eastern are attracting manufacturing. The Northeastern region is not only lagging behind in terms of its economics. Other Thai people regard Northeasterners as 'ignorant and arrogant' people (Howard, 2008) and ethnically Lao who are different than the ethnic Thai.

There are several explanations for regional disparity in Thailand. One explanation is that favorable conditions of Bangkok. Bangkok is located near Chao Phraya River and has extensive hinterland where agricultural productivity is high. Due to these conditional advantages, historically Bangkok could prosper and sustain a large population (Parnwell and Arghiros, 1996). The fast growth of Bangkok has not been hindered and further enjoyed economy of scale (Kittiprapas, 1999).

On the other hand, Northeastern region was alienated from the development trajectory. There was no incentive to invest in the Northeastern area because there was no attractive natural resource. Even when France was aggressively expanding their influence in Southeast Asia, French had no interest in colonizing the Northeastern region in Thailand (Dixon 1997). Also the agricultural productivity is relatively low. Annual

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<sup>⑥</sup> Source: Office of the National Economic and Social Development Board(NESDB) <http://eng.nesdb.go.th/>

average precipitation is around 1200-1500mm which is enough for rice farming, but double-cropping is impossible (Rogers, 1989; 84). Low productivity is reflected in the fact that farm lands in Northeastern account 46% of total farm land in Thailand but the production amount is only 25% (Walton, 1996).

In terms of Thai politics, as central government was located in Bangkok, development policies mainly focused on Bangkok (Parnwell and Arghiros, 1996). During the 1960's, the Thai government promoted import substitution industrialization policies. Selected industries were usually non-agricultural because those products were mainly imported (Kittiprapas, 1999). Other regions where agriculture was a main industry suffered damages by this policy. In addition, the Thai government shifted the strategy to export oriented industrialization and took advantage of cheap labor. Migrants from rural area moved to Bangkok which further impoverished other regions (Kim, 2000).

In a historical perspective, Northeastern region was separated from the central Thailand for a long time. Until the mid 17<sup>th</sup> century, there was no direct relationship between Thailand and Northeastern. Khmer ruled Northeastern until the 11<sup>th</sup> century and from the 14<sup>th</sup> to the 16<sup>th</sup> century, migrants from Lan Xiang (Laos) had settled down in the Northeastern region. This is why Northeastern dialect is almost same as Lao language and their ethnic group is classified as Lao. The border of Ayutthaya and Lan Xiang was near Nakhon Ratchashima and Phimai which is still an administrative border between other regions and Northeastern region.

After Chakri Kingdom was settled in today's Bangkok area, Northeastern became a part of Thailand. However, Northeastern was divided into several

Muangs which were autonomous regions. Lords could maintain their rights by paying tributes to the kingdom. In 1892, every right of autonomy was deprived from lords and the central government directly ruled Northeastern. Harsh reign of the government sometimes resulted in protests. After all, central government regarded Northeastern as a useless land (Myers, 2005) but a buffer zone between Thailand and French Laos (Hewison and Thongyou, 2000). This historical indifference to Northeastern is also one of the reasons of underdevelopment and ethnical difference. To prevent the wave of communism, the Thai government started to develop Northeastern region starting in the 1960's. However, still there is no clear improvement in reducing the regional disparity especially in Northeastern Thailand.

### **3.2.2. Sugar industry in Northeastern Thailand**

When Thailand first started to export sugar to the international market, the main sugar cane farm was located in Central Thailand. During the 1970's more than 60% of sugar canes were produced in Central Thailand. However, sugar cultivation started to extend over to Northeastern Thailand. As a result, since 2002/03 sugar season, planted areas of sugarcane in Northeastern have exceeded the ones of Central (Ekasingh et al., 2007; 77).

There are two main government policies which resulted in the expansion of sugar cane cultivation in Northeastern Thailand. (Ekasingh et al., 2007; 93). First, the Thai government was eager to relocate the mills to reduce income inequality. This policy corresponded to the farmers' interest as they wanted additional income source. By the pricing policy, price of the sugarcane was relatively stable than other crops which led farmers to expand their cane field.

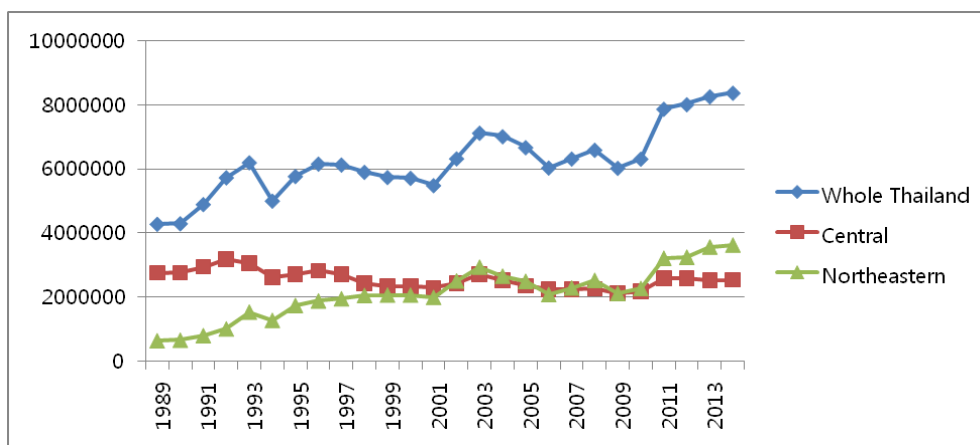


Figure 11. Planted area of Sugarcane from 1989 to 2013 (unit:rai)

Source: Office of Cane and Sugar Board

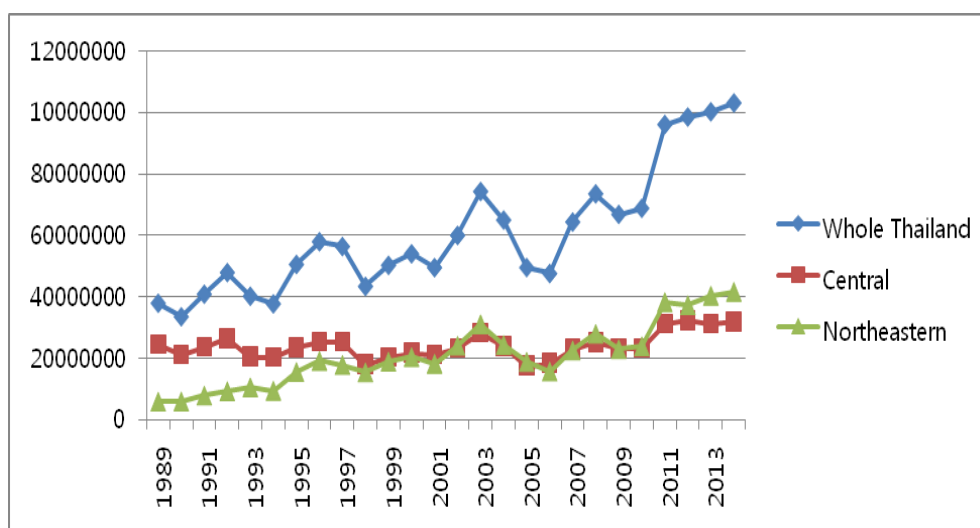


Figure 12. Sugar cane production from 1989 to 2013 (unit: ton)

Source: Office of Cane and Sugar Board

As Northeastern is important region for sugar cane cultivation, several agricultural institutions are located there. One of the Office of Cane and Sugar Board promotion centers is located in Udonthani province. In Thailand there are 27 sugarcane associations and 11 of them are established in Northeastern. Three are in the Nakhon Ratchashima province, two in the

Khon Kaen province, one in the Chaiyaphum province, two in the Udonthani province, one in the Buri Ram province, one in the Mukdahan province and the last one in the Kalasin province. 13 sugar mills are operating in the provinces where sugarcane association exists.



## **IV. Upstream sugar Value Chain in Northeastern**

The field work was performed from February 9<sup>th</sup> 2014 to March 10<sup>th</sup> 2014 in Khokphochai and Manchakhiri district of Khon Kaen province. 33 farmers, 1 broker, 1 branch manager and 1 growers' association manager are interviewed. During the field work, one Thai who can speak English and one Australian assistant who can speak Thai interpreted the interview. This is favorable condition because native English speaker and native Thai speaker could provide information precisely to the researcher in English. Interpreters first questioned in Thai language and after the interviewees answered in Thai language, answers were translated into English for the researcher to understand. To ensure proper interview, the first stage of the field work was translating the interview sheet and explaining about the interview questions to the interpreters. During this process, some questions were slightly modified to reflect the local context. Interviews with a broker, branch manager and association manager were arranged in advance.

Farmers are randomly interviewed at villages, weighing stations in Khokphochai and Manchakhiri district. One possible bias result from the interview is that some interviewees are already acquaintance with the interpreter. However, the interpreter is not involved in sugar industry himself, so this bias is not degrading the neutrality of this study. Interview is conducted in an open-end style. Questions about basic information are first asked and governance, policy, labor and other issues follow during the interview. Additional questions are raised after each question if more information is needed to understand the previous answer. Each interview usually takes about 20-40 minutes. The farmers who have more opinion

provide further information while farmers who do not have a quota could not answer to several irrelevant questions. Interview itself is performed under free, conversational atmosphere, so there are several statements which are not related with the study. However, it provides a good way to start talking with the interviewees.

First farmer interview is conducted as a pilot interview to acquire overview of the upstream value chain. This farmer is living in Namphong district not in Khokphochai and Manchakhiri, so not included in this study. Cane growers' association is also located in Namphong. Association manager provided useful information, but only general information which can be applied to Khokphochai and Manchakhiri are utilized in this study as it is located outside of the research area.



Figure 13. Location of Khon Kaen province

Source: Modified from [en.wikipedia.org](https://en.wikipedia.org)

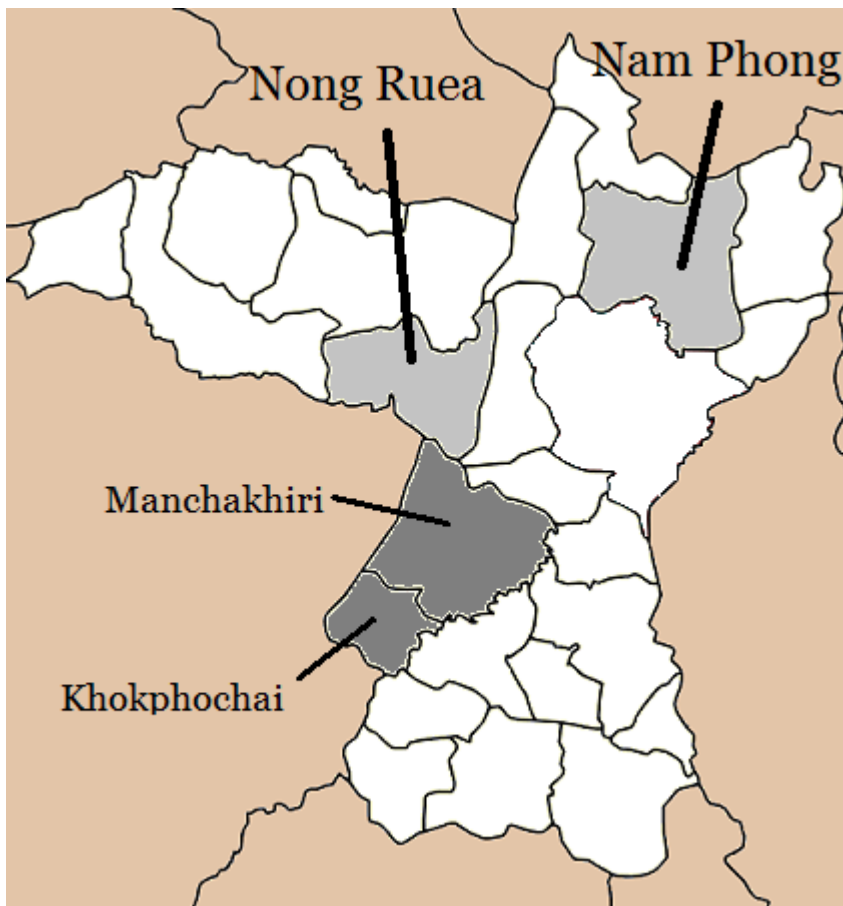


Figure 14. Location of Manchakhiri, Khokphochai, Nong Ruea and Nam Phong

Source: Modified from en.wikipedia.org

Note: Cane Grower Association and Factory are located in Nong Ruea and Nam Phong district.

As illustrated in Figure 14, Manchakhiri and Khokphochai district are located in the southwest of Khon Kaen province. Two sugar mills and two cane growers' associations are located in Namphong and Nong Ruea district respectively as described in Figure 14, while there is no mill and association in Manchakhiri and Khokphochai district. Most of the canes produced in both district are crushed at the factory in Nong Ruea due to its proximity. Table 4 shows basic statistics of sugar cane farming in Manchakhiri and Khokphochai district. The price difference between two districts implies that additional price to 900 baht varies according to the sweetness level. In 2011, the announced price was 942 baht.

	<b>No. of cane growers</b>	<b>Planted Area(rai)</b>	<b>Harvested Area(rai)</b>
<b><i>Manchakhiri</i></b>	3,901	68,101	51,843
<b><i>Khokphochai</i></b>	293	12,533	10,257

	<b>Total Yield (ton)</b>	<b>Yield per rai (ton)</b>	<b>Price of sugar canes(Baht/ton)</b>
<b><i>Manchakhiri</i></b>	446,271	8.6	1010
<b><i>Khokphochai</i></b>	81,690	8.0	1050

Table 4. Sugar farming in Manchakhiri and Khokphochai district (2011)

Source: Khon Kaen Provincial Agricultural Extension Office

<b>Average Age</b>	47.1 years old
<b>Average Planted Area</b>	23.56 rai
<b>Land Ownership</b>	Own 30 Mixed 2 Tenant Farming 0
<b>Average Yield</b>	10.11 tons per rai
<b>Location</b>	20 in Kokphochai, 12 in Manchakhiri
<b>Buyer</b>	Broker 18 Miller 11 Both 3
<b>Association Member</b>	5

Table 5. Basic Information of the interviewed growers

Source: Own survey, N= 32

Among the interviewees, 20 farmers are living in Kokphochai and 12 farmers living in Manchakhiri. The average age of the farmers is 47.1 years old. Except for 9 interviewees, all replied that farming is their main occupation. Only two farmers rented land, but even in his case, they both possessed own land which they cultivated themselves. According to the OCSB, cane farmers who cultivate less than 60 rai are classified as 'smallholder'. According to this classification, with the exception of only two farmers who cultivated 120 rai and 100 rai respectively, every interviewee belongs in smallholder category. Average planted area of sugar cane is 23.56 rai and average yield of sugar cane is 10.11 tons per rai which is slightly higher than the average of the whole district. None of the interviewees is cultivating only sugar. Every farmer cultivates rice, and 16 replied they also cultivate tapioca. Only 5 growers are verified themselves as members of sugar cane growers' association. This is because there is no

association located in Kokphochai and Manchakhiri. There are two associations, located in Namphong and Nong Ruea district where big sugar mills established by Mitr Phol and Khon Kaen Sugar Ltd.

## **4.1. Upstream Value Chain structure**

### **4.1.1. Growing and harvesting sugar canes**

Sugar cane growers in Khokphochai and Manchakhiri start the sugar season in October. As mentioned in chapter 3, the wet season in Thailand ends in October. They feel October is a good time because of the moist soil which results in high weight of canes. When they plant canes, they can plant by hand or planter. 22 interviewees answered they utilize planting machine while other smallholders do the planting themselves. Only three farmers have their own planting machine. Other farmers borrow the machine, but the cost ranged from 300 to 800 baht per rai while one answered the rent was free from his neighbor and borrowed from their relatives or neighbors. This indicates in the planting stage, the level of mechanization is relatively high, but no official effort is made to organize the rental deals. Even though farmers plant the canes by machines, they hire workers because mainly 3 workers are required to plant efficiently.

After planting, cane farmers put fertilizers on their land. The price of the fertilizer is usually around 1000 baht for one bag and two bags are spread for one rai of land. It is better to put more fertilizers, but every interviewees answered they put fertilizers once. Pesticides are also spread on the field, but interviewees mentioned the cost of buying pesticides is minimal in terms of the whole cost. Water supply is important to sugar cane farming but less than rice and tapioca. Due to this reason, only three growers utilize an external water source. According to this facts, high dependence on rainfall is not a severe risk to the cane growers which is not corresponding to the previous literatures mentioned in the earlier part of this research paper. One farmer clarified the price of water is 200 baht per ton, but this



price is maybe not applied to every growers. During the harvest season, none of the farmers use harvester, only manual labor. Only six farmers harvest by themselves while others hired workers to harvest. Growers harvest canes which are 12-14 months old

Recruiting process is quite informal. Farmers try to find anyone who is free during the harvest season and ask them to work at their field. Only one farmer replied he has regular workers who help him every season and another one farmer write a contract to guarantee the recruitment. This casual recruitment process is prevalent because the growers hire their relatives or neighbors. No farmers require specific skills from their workers for harvesting. Whoever is free and healthy are the workers farmers hire. In some cases, owner of the land are not directly involved in the cane cultivation. Two interviewees who described themselves as a subsidiary farmer merely supervise the cultivation. However, it is not the tenant farming system because the land is not rented to other farmers, only workers receive wage from the land owner. Wage amount paid to the workers is different between the growers. It can be time based or task based. For planting, usually it was time based; usually 200 baht for one day. Workers for harvesting are mainly paid based on the amount they cut. 2 baht are paid for 10 or 15 sticks of canes. Also money can be paid based on harvesting one ton of canes or one rai of land. The verified wage is between 200 to 270 baht for one ton and 300 baht for one rai. This highly different payment system also proves that employment process is not formal but follows individuals' decision.

#### **4.1.2. Marketing sugar canes**

After harvesting, canes are transported to the weighing station. These

weighing stations are owned by the mills or by the brokers. Mostly, cane growers are liable for transportation of the canes to the weighing station. In one case, the grower signed a contract and broker has to transport the canes. If they do not have their own truck, they have several ways of transporting their canes. If the workers who are hired for harvesting have their own truck, growers pay additional money for the use of the truck. Transportation service from brokers and millers is another option, and growers have to pay each time of transportation. However, except three interviewees, every farmer has their own truck, usually less than 10 tons capacity.

After the canes arrive at the weighing station, canes are weighed and farmers receive money based on the weight. First, the cane loaded-truck is weighed and then empty truck is weighed to check the weight of the canes. 18 farmers replied they sell their canes to the broker while 11 sell to the mill directly and 3 sell to both the broker and the mill. The farmers who sell to the mill have a quota. This quota is set before the planting season and the growers and mills write an official contract form when they have a meeting between the whole quota growers and the mill. Growers have to produce at least 50 tons of sugar canes to enroll a quota. If these quota growers produce more than the quota, they can freely sell it to the broker or the miller. It is also possible that growers report lower than the actual produced amount and sell less than the quota. The remaining crop is then sold to others. On the other hand, growers who only deal with brokers do not have a quota and not registered as an official sugar cane grower. This is perhaps the reason why the enrolled number of sugar farmers in Khokpochai is much lower than Manchakhiri because except one grower, every interviewee from Khokphochai sells their canes to the brokers as unregistered sugarcane growers.

According to the 1984 Cane and Sugar Act, the OCSB announced the first price as 900 baht per ton for the 2013/2014 sugar season. Every official grower can only sell their canes by this price to the millers. The money amount is not directly given to the growers at the weighing station. After the weighing process, canes are sent to the mill. At the mill, canes are crushed and the sweetness level (CCS) is measured. For each percent of sweetness level, 6 baht is added to the price of one ton. This is much lower than 40% of the whole price of sugar canes. No interviewee is well aware of their sweetness level, but according to the weighing station manager, usually it is between 9 to 14%. This calculated amount of money based on weight and sweetness level is then wired to the growers' bank account. If the first price announced by the OCSB is lower than the second price, growers can receive money from the millers. When the field work is implemented, it was in the middle of sugar season, so the differential for 2013/2014 season is not verified. For 2012/2013 season, official growers received 160 baht for each ton of canes as compensation.

The growers who sell to the brokers weigh their canes and are paid money based on the weight. Because this type of growers is not official sugar cane grower, they are not protected by the 1984 Cane and Sugar Act; no additional money from sweetness level and price differential are paid to these growers. Growers can receive this additional money if they make a contract with the broker; however, only one interviewee has this sort of contract. There are several reasons for remaining as an unofficial grower even though they cannot enjoy additional benefits. Nine interviewees out of 18 growers who deal with brokers said the reason why they remain unofficial is the proximity to the weighing station. This indicates transportation cost is one of the main burden or they are reluctant to drive far away.

There are other reasons why they deal with the brokers. One reason is that they are not capable to produce 50 tons to be a quota farmer. Two interviewees also said they do not want to be involved in additional procedures. They prefer receiving cash directly at the weighing station without doing any document work or setting up a bank account. The most prominent reason is that they prefer quick cash. Six growers who sell their canes to the broker replied they prefer quick cash. This corresponds to the answers that additional procedures are annoying. In some cases, growers need quick cash to pay the hired workers. When there are not enough people to hire, growers pay the wage in advance to guarantee the recruitment. While, four official growers who have a quota mentioned they sometimes sell their canes to the broker for quick cash.

Last reason of remaining as an unofficial grower is they receive better price. As the transaction between growers and brokers are unofficial, they do not need to sell and buy by the announced price. Brokers announce the price on the signboard which is erected in front of their weighing station. Growers notice the price by looking at this sign board or listen from their neighbors. Price itself is not really different with the officially announced price, but not lower than the official price. Only one farmer who is not reliable for transportation and harvesting received lower price. The highest price set by the broker is verified as 950 baht per ton while there are several different arrangements. Some brokers give additional amount of money for each time of transaction and others provide a lunch box or 30 baht for a drink.

#### **4.1.3. Weighing stations**

After all canes are weighed and money is paid to the growers, from each

weighing station canes are transported to the mill. In the case of the branch of a mill, they are directly owned by the mill and their main tasks are arranging the quota and guaranteeing the transportation of the quota amount to the mill. Before the season starts, the staff of the station estimates the expected yield of the farmers they deal with. The estimated yield is sent to the headquarters, approved by the headquarters, and then the staff strives to purchase enough canes. If they cannot meet the assigned amount, they can be fired, but according to the manager it rarely occurs. Staff members are required to have a degree in agricultural and are trained at the company's training center. However, they do not learn about the actual agricultural practice. The manager mentioned, it is because farmers are expected to have better knowledge than the staff. Due to this reason, there is no relevant training program provided by the company for the growers.

The brokers, on the other hand, they are totally independent agent in the value chain. Brokers themselves can be farmers or only middlemen. They also need a quota and sign a contract to supply canes to the mills. As they have a quota, additional money from sweetness level and price differential belong to the brokers and this is their main source of profit. To establish a business, a vast amount of initial investment is required. Truck costs 2,000,000 baht and the scale costs around 250,000 baht. Brokers can borrow money to start their business, and in this case their liability leads them to mainly trade with the creditor. However, after the first investment, the additional investment is relatively low which allows the brokers to collect the initial capital in 2 or 3 years.

The broker who is interviewed mentioned establishing the right 'connection' is the critical element of successful business. To enhance the

relationship with the farmers, brokers themselves behave as financial institution or provide additional benefits such as 30 baht lunch box which is already mentioned above. However, the relationship between the brokers is competitive. The broker who is interviewed said he is not willing to share any know-how or their personal network with other brokers. This is perhaps growers can easily switch the buyer.<sup>⑦</sup> Unlike the branches, if brokers want to earn more profit during non-sugar season, they utilize their scale for other crops.

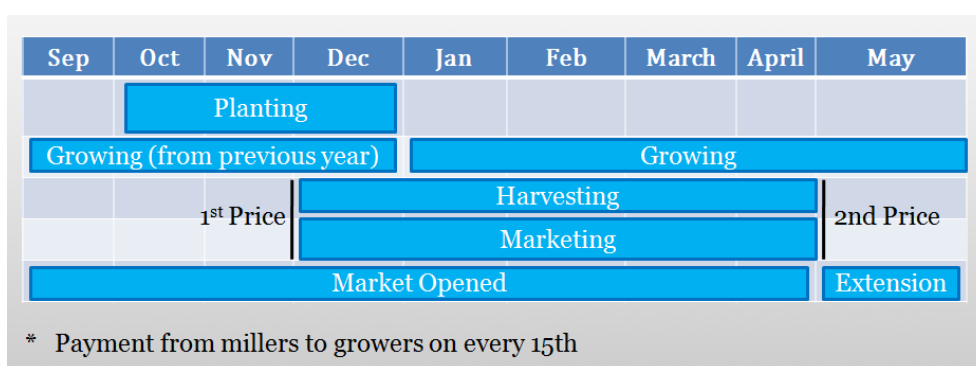


Figure 15. Time schedule of Sugar Cane Farming

Source: Drawn by author

<sup>⑦</sup> This is because vast number of buyers is existing and as sweetness level is unconsidered, sugar cane are basically identical.

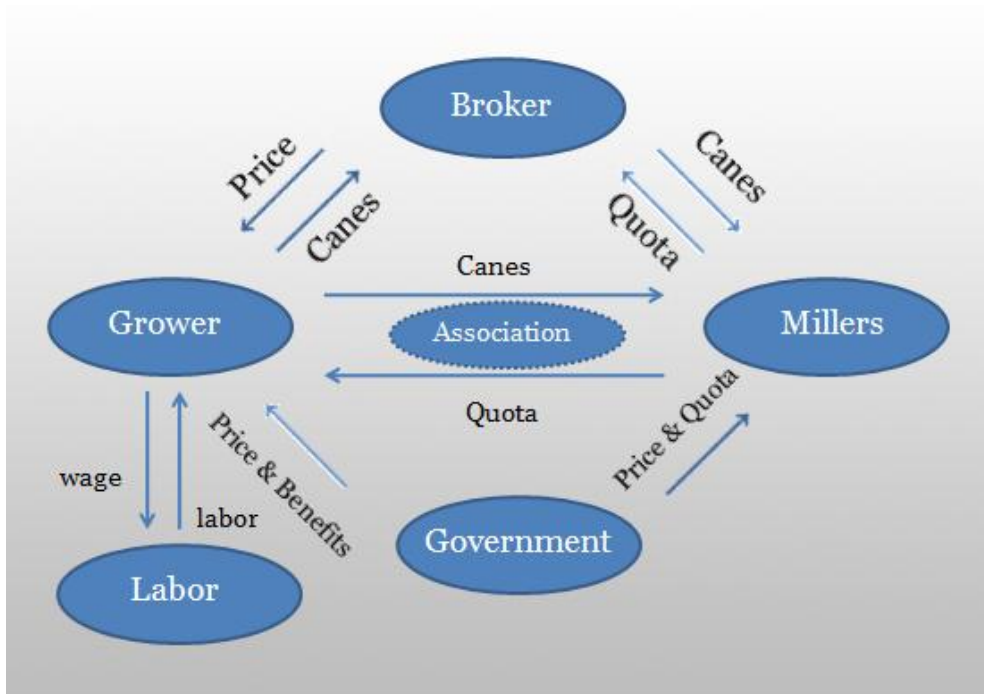


Figure 16. Organization of upstream sugar value chain

Souce: Drawn by author

Note: In Khokphochai and Manchakhiri, role of the association is not important

## 4.2. Governance structure of the upstream sugar value chain

Here the governance of the ‘upstream’ value chain refers to the relationship between the mills and sugar cane growers. According to the definition of Value Chain governance, the agents should be a firm. The growers are not a firm, but because they are the decision makers in the value chain, they can be regarded as independent actors who establish a relationship with other agents in the value chain.

#### **4.2.1. Complexity of information and knowledge transfer**

From this part, dimensions which define the governance type (Gereffi et al., 2005) are applied to the upstream sugar value chain. Three variables which are discussed in chapter 2 are adopted. First, the complexity of information and knowledge transfer is very low in the upstream sugar value chain. Weighing station of the mills impose two main requirements to the farmers. They want the growers to produce sufficient amount to meet the quota and sell it during the weighing station is opened. Weighing stations are opened from September to April. For the brokers, they try to buy as much as they can from the growers but still need to conform to the time schedule set by the mills. So they also set a time schedule and require to the farmers to sell it only during that time.

Besides, there are minor requirements for good quality of canes. If the sugar canes are burned or become dirty, growers have to pay 20 baht fine per ton. However, as the price of one ton of sugar cane is 900 baht it is relatively negligible. No interviewees answered it is hard to keep the canes clean or making the additional effort. Information which is needed to meet these requirements is simple and knowledge transfer is also simple. Thus, it can be concluded that the complexity of information and knowledge to maintain the value chain is low.

#### **4.2.2. Level of codification**

The level of codification is high as the complexity of requirements is low. Most of all, official cane growers write a contract which includes the quota amount and related clauses, so the growers easily understand the requirements. In addition, sign boards erected in front of the weighing



station also display the time schedule and quality requirements. In the case of the transaction between brokers and cane growers, they usually do not write a contract together. However, also the sign board informs the growers when they can sell the cane and the price of the canes. Because the brokers only need to gather the canes to satisfy the quota, there is no requirement to the growers for quality. No tacit knowledge is exchanged between the growers and millers while requirements are codified. Thus, level of codification is high.

#### **4.2.3. Capability of suppliers**

Capability of suppliers is quite questionable to conclude if it is either high or low. Requirements for quality of the sugar canes are not problematic to the growers because they can easily fulfill or bear fine. However, the time schedule and the quota are sometimes a burden to the growers. Because the sugar cane yield fluctuates due to the weather condition, if there is a severe drought, growers fail to meet the requirement. But no interviewee complained about this issue. The brokers and millers even do not amerce growers when they cannot produce as much as the quota and fill the shortage by purchasing surplus from other growers.

The time schedule ranges from September to April, lasting for about eight months long. Even though growers can harvest for several months, weighing stations are congested because growers want to sell their canes when the canes are in their best condition. The growers usually hire workers to harvest their canes, but when the season is busy, they have a hard time finding the workers. Due to this reason, growers fail to sell their cane until the time schedule ends. To solve this problem, growers burn their field to harvest quickly or leave the canes for the next sugar season. The

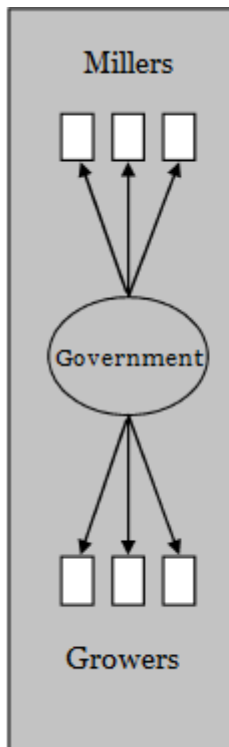
brokers and millers help the growers by extending the time schedule, introducing some workers who can help harvesting or lending money for paying wage to the workers. Therefore, even though the growers don't have the capability to sufficiently meet the requirements, there are several outside sources of help in solving the problem the farmers may face. So if the capability of the suppliers can either be considered between 'high' or 'low', giving a 'high' value is more reasonable.

#### **4.2.4. 'State-led' markets value chain**

According to Humphrey and Schmitz (2002), there are four governance types. There is no clear definition of the product, as sugar cane is a highly standardized commodity. The millers and brokers only want a sufficient amount of sugar canes. They do not impose a high level of requirements to the growers. The growers also have enough capability to produce canes. Another dimension is risk. There are no official standard and special quality requirements except cleaning the canes. Only one risk the buyers face is time. However, as explained above, even though time schedule is a recognizable risk, it is not perceived as a real threat to them. Thus, according to these discussions, governance type of upstream sugar value chain can be classified as 'arm's length market relations'.

On the other hand, regarding three dimensions discussed above, according to the classifications provided by Gereffi et al.(2005), upstream sugar value chain is much like '*Markets*' governance type. Transactions are easily codified, the complexity of information is low, and the capability of the suppliers is relatively high. However, the most important characteristic of Markets type governance does not exist: the price. In the Markets type, the price is the signal of coordinating the value chain

integration. The price of the canes is set by the government agency, the OCSB, and even the brokers who do not need to follow this price are offering basically the same price. This price fixed by the government is the main dynamic of coordination within the upstream sugar value chain. In this perspective, it may be more reasonable to argue it is the 'State Governance' type because transactions are coordinated by the price set by the government and the value chain is not strongly integrated. Ponte and Sturgeon (2014) argue that only three variables cannot explain the chain governance and Fold (1998) insists governance is embedded within the regulatory mechanism by the government. According to these discussions, it is fair to add 'government' as another variable for the governance system. Thus, integrating Markets and State governance, the upstream sugar value chain is possible to be named as 'State-led Markets value chain'. The concept of State-led Markets value chain is illustrated in Figure 17.



### State-led value chain

- Low complexity
- High level of codification
- Relatively high capability of suppliers
- 'Price' is not a signal
- Governmental institution is governing the chain
- 'State-led markets value chain'

Figure 17. 'State-led' Markets value chain

Source: Adapted from Gereffi et al., 2005

## **V. The Middle Income Trap and Value Chain**

In the previous chapter, it is verified that governance structure of upstream sugar value chain can be classified as ‘State-led’ Markets value chain. This is because the government agency is highly involved in the price setting, and governance type of upstream sugar value chain does not perfectly corresponds to previous studies. Most of all, there are several issues within the upstream value chain due to this mismatch. This chapter explains the issues and figures out the linkage with the Middle Income Trap and provides any practical implications.

### **5.1. Relevant issues within the upstream sugar value chain**

This subchapter attempts to describe the problems within the upstream sugar value chain by empirical analysis additional to the issues of sugar industry which are mentioned in chapter 3.

#### **5.1.1. Knowledge exchange**

The first point is about knowledge exchange. The extent of knowledge exchange is low because there is no case of applying better agricultural practices from research centers, and any information provided by the millers and brokers are not practiced. Growers who are a member of the association did not receive any knowledge from them. One grower replied he learned from the broker, but it was only introducing a better fertilizer which is sold by the broker. Three interviewees learned about cane cultivation from the mill, but similar to the other growers who have a quota,

they are not applying the knowledge. This indicates knowledge exchange between the growers and the mills are not meaningful. Four cases are verified that they learn better practice from the local agricultural office and the agricultural bank. These cases are a hopeful sign, but still the low level of knowledge exchange is problematic because the majority of the growers do not have meaningful node for knowledge acquisition. This problem is clarified by the answers to the question; 'what can you do for better yield and quality'. Only two growers mentioned about utilizing equipments or planting new strands, while others only said put more fertilizer.

Besides the technical knowledge, growers are not well aware of relevant policy issues. None of the grower knows the process of how the price set. They do not know the 70% of total profit from sugar is allocated to the growers, and only two interviewees understand that the government, millers, and farmers (association) in the OCSB set the price. However, growers are well aware of the Commercial Cane Sugar. Every grower who has a quota knows about the CCS because they earn the additional profit. Even the growers who do not have a quota know what the CCS is. Six interviewees out of 18 growers who are non-quota growers do not know while the other 12 know even though they are not directly benefited from the CCS. Also the quota farmers know that they are supposed to receive differentials when the first price is lower than the final price. The majority of non-quota farmers know about this payment system, six replied they do not have any idea. This gap of awareness indicates that growers are familiar with policies which are directly related to them while they regard the price setting is not their business. The critical issue here is that they are passive price taker. They reluctantly follow the price fixed by the government and remain static within the value chain.

### **5.1.2. Cooperation and trust**

Another problem revealed in the upstream value chain is the lack of elaborate cooperation between the actors. It is almost true to conclude that the actors do not trust each other. As mentioned above, growers are not aware of the price setting system. 11 of the growers said they think the millers set the price. And the growers who think the millers are involved in the price setting complain about the low price and feel they are cheated by the millers.

Distrust is also found in the Commercial Cane System. When the canes are transported to the mills, canes are crushed. Sweetness level is measured at this stage, and the growers are paid additional money based on the quality. Payment process itself is not problematic. The problem occurs when canes are actually crushed. After weighing the canes, manager at the weighing station records the amount of the canes and who produced it. This is how specific growers receive money by producing better cane quality. However, when growers sell their canes, they transport it by their own truck which cannot carry as much as the capacity of the crushing machine<sup>®</sup>. So when canes are actually put into the machine, canes from several growers are mixed. This way, the millers cannot precisely measure the sweetness level of canes from each grower. The growers can only receive money based on the quality in a random way. Only growers who have a big truck can fairly get additional profits from the sweetness level. Due to this reason, even farmers who said they are happy with the CCS, still felt that their products are not fairly measured. So, for the growers, they do not have any proper incentive to improve the quality of the canes.

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<sup>®</sup> For example, if a grower sells 10 tons of cane and the capacity of crushing machine is 100tons, 90 tons consist of the canes from anonymous growers.

Furthermore, the millers do not believe the growers. The growers are assigned to produce up to the amount of quota, but it is possible to sell a fewer amount to the millers and lie there was a problem. Then they sell the remaining to others who offer a higher price. The weighing station manager said, to prevent this problem, they try to make the growers more liable to the millers. Even though asking about this issue to the growers was too sensitive, one grower replied some growers cheat the millers. Borrowing money from the millers is not preferable because their land is mortgaged which indicates the strategy of millers is an imperfect measure to guarantee growers' fulfillment.

In contrast, brokers attempt to maintain the cooperative relationship with the growers as a good 'connection' is a critical factor of a successful business. Because growers have to give up benefits provided by the government, brokers adopt several measures to be in a good relationship with the growers. As already mentioned, brokers offer a slightly higher price or other benefits such as a lunch box or drinks. Also brokers realize that growers prefer cash, so they pay cash to the growers. However, the result of this struggle to ensure good relationship is basically as same as the relationship between growers and miller. This is obvious because canes are priced only by the weight. Growers similarly have no incentive to improve the quality of canes.

Distrustful relationship can also be found in the recruitment process of the growers. Because utilizing the harvesting machine is not prevalent among the grower, they have to hire workers to harvest their canes. It is already described that usually there is no official form to guarantee the employment, and they find workers from their neighborhood. If they believe each other, this unofficial recruitment will not be a problem.



However, because the harvesting season is very busy, there is an insufficient number of workers. Then hired workers can violate the verbal promise and work for a person who offers a higher wage. Furthermore, no growers said they pay more than the minimum wage (300 baht per day) to the workers, so this is perhaps the reason why the arrangement is easily violated. When growers cannot find workers, they finally burn their field and harvest quickly or leave the canes. This is not desirable because if canes are burned, moisture of canes evaporates which finally results in lower yield and quality.

To solve this problem, growers have to pay money in advance to the workers. Every grower who has adopted this payment method said if workers first receive money, then they do not violate the promise. It is possible to conclude that if paying money in advance guarantees the actual employment, growers have to follow this practice to solve the labor shortage. However, this method causes another problem. To pay the workers before selling their canes, growers need cash. The easiest way of acquiring cash is selling their canes to the brokers because quota farmers have to wait until 15<sup>th</sup> of every month. This is another reason why growers give up the compensation for the price difference and the CCS and decide to deal with brokers directly. If growers are more likely to transact with the brokers and remain as a non-quota grower, they have literally 'no' incentive to increase the quality of their sugar canes even though the growers who deal with the millers are not really interested in quality issue. In the State-led markets value chain, price cannot be the proper signal for an efficient economic activity. Without any price competition, if there is a high level of cooperation, better quality and process can be achieved. However, buyers and suppliers within the upstream value chain are not reliable to each other.

There is one more aspect of low level of cooperation. Sugar cane growers

are not utilizing harvesting equipments but hiring workers. This is because they cannot afford it (Doner, 2009). The problem here is that, there is no collective effort among the growers to purchase equipments or any clear support from the millers. Utilizing harvesting equipments will be useful because growers can harvest their canes efficiently. In terms of employment, the required labor for harvesting machine is lower than harvesting by hand. Thus, the labor shortage can be solved easily by adopting harvesting equipments.

### **5.1.3. Over capacity**

The third problem is from the millers. From the interview with the weighing station manager from Mitr Phol, sugar mills have over capacity. Even though they collect the canes of quota amount, still it cannot fill the whole capacity of the mill. So, their priority is purchasing canes as much as they can, not seeking good-quality sugar canes. Such practice is clearly revealed from the pricing system. The mills only pay six baht per ton for one percent of sweetness level while one ton of sugar cane is 900 baht. The manager mentioned that if sweetness level is around 14%, it is a good quality cane and the bad quality is considered to be around 9%. So, for one ton of good quality sugar cane, additional profit is only 30 baht which is minimal comparing to the standard price based on weight.

Over capacity cause inefficiency at the weighing station also. The millers can produce sugar due to their high capacity, so the precise time schedule for cane supply is not required. Growers try to sell their canes when the quality and the weight are at best, so the weighing station is crowded. If the millers have to adjust their crushing schedule carefully, some arrangements between growers and them are necessary. However, there is no need of

arrangements, so growers have to wait a long time at the weighing station to sell their canes. In the worst case, one farmer said he had waited for 4 days at the station. If canes are cut and left for 4 days, according to the association manager, maximum of 40% of weight and 8% of sweetness level can be decreased. This case maybe cannot represent the whole situation for growers; however, at the weighing station, it was easy to witness growers giving up to sell their canes and going back to their home. Due to this congestion at the weighing station, growers are unwillingly spoiling their canes and wasting their time.

Because of the discussed aspects of inefficiency, for the both side; millers and growers, do not have any reason for a better yield and quality of sugar canes. In the next subchapter, how these discussed issues are related with the Middle Income Trap will be explained.

## **5.2. The Middle Income Trap and Value Chain**

As discussed in Chapter 3 and 4, the sugar industry in Thailand is trapped in the middle and the trap itself can be understood as stagnation in the value chain. Further, by empirical data, the previous subchapter described several issues which are causing inefficiency. In this subchapter, how the aspects of disutility are related with the Middle Income Trap is introduced in terms of the Value Chain approach.

To escape from the trap, upgrading within the value chain is necessary because upgrading results in additional value creation and allow the actors be dynamic not stagnated in the value chain. In the upstream sugar value chain, the only product which is traded is sugar cane. If growers are willing to achieve inter-sectoral upgrading, they would be involved in other crop cultivation. In terms of functional upgrading, growers can behave themselves as a broker or another chain-actor. However, this study mainly focuses on the relationship between the suppliers (growers) and buyers (millers and brokers), so the process upgrading and product upgrading are regarded as a possible upgrading trajectory.

In agro-food value chain, it is hard to distinguish between process upgrading and product upgrading, because the new process generates a new product (Ponte and Ewert, 2009). This is also applicable to the sugar industry. The price of sugar canes is based on weight (yield) and sweetness level (quality)- better process results in a better quality product and an additional yield which corresponds to process upgrading and product upgrading. Thus, discussions are mainly focused on the production and the trading process.

### **5.2.1. Investment and R&D**

In chapter 2, it is already explained that the low level of research and development activity (R&D) and the investment rate are the reasons of the Middle Income Trap. These are also critical in the Thai context. By investment and R&D activities, there are several ways of succeeding in upgrading. Equipments which increase the efficiency can be adopted for cultivating canes by investment. New strands of canes and better agricultural practices will also enhance the productivity. However, it is clear that investment and R&D are not brisk. Growers have no method to acquire enough capital for equipments and they are not applying any type of research findings in their cultivation activity. According to a press packet which is made by Mitr Phol, research institutes are promoted, but still the institutes are not fully functioning which is shown clear from the interviewees answers. Thus, the investment and the R&D which enable upgrading are not adequately functioning and stagnating the upstream value chain.

### **5.2.2. Labor shortage**

Labor is one of the most important points of discussing the Middle Income Trap. Usually, the labor cost is much more critical because the trapped countries cannot enjoy the competitive advantage from cheap and abundant labor. However, in Thailand's context, the labor shortage is more relevant. As mentioned in Chapter 2, labor shortage is not only about high-skilled but also on the low-skilled labor market. The workers who are hired for harvesting are not required to have a high level of skill. Their task is cutting the canes in a right way. Most of the growers harvest their canes in a same season because it is the most favorable time for good sugar canes. However,

the low level of mechanization requires the growers to hire workers. Because the growers have to hire workers in a same time period, they cannot find enough workers to help them. It is already shown that due to this labor shortage, growers have to abandon their canes or harvest burned canes which are a low quality product. Also, it results in more reliance on brokers as explained before. Thus, due to labor shortage, growers cannot even reap benefits which are even not sensitively related with the millers or government and fully utilize their assets and ability. By utilizing adequate labor, growers can harvest good quality canes and also have incentive to enhance the quality to acquire more benefits because they do not need cash. This clear and moderate upgrading is however, not expected to be solved easily.

### **5.2.3. Institutional context**

Especially in the Thai context, it is already mentioned that institutional weakness is trapping the country in the middle, and the right incentive system has to be introduced by better institution. How is the institutional weakness in macro-scale revealed in the upstream sugar value chain? The most important institution in terms of the relation between growers and millers is the 1984 Cane and Sugar Act. According to the 1984 act, governmental agency OCSB decides the price and production of canes and due to this act, the relation between growers and millers has been stable. This relation was termed as ‘State-led Markets value chain’ in Chapter 4. However, the stable relation did not result in a close or a mutually dependent relationship. Due to the fixed price and almost fixed quota, growers and millers do not have a clear reason to establish a high level of coordination. Growers have no incentive to produce good quality canes but passively follow the fixed price. Millers do not impose specific requirements

except a long time schedule. As millers can crush more canes than their quota amount, their goal is purchasing enough quantity not good quality canes. The quantity-based incentive is hampering efforts for improving quality. If this situation does not change, the low productivity comparing to leading sugar countries will not be solved.

### **5.3. Possible Suggestions**

In this part, several suggestions which can be helpful are introduced. State-led Markets value chain is not favorable for the growers and the millers, because the price cannot be a signal for coordinating them. Therefore, for upgrading, this study suggests governance have to transform into relational or network type which are characterized by a high level of mutual dependence between growers and millers.

To establish a reciprocal relationship, cooperation and trust are required. First, better agricultural practices and equipments should be introduced. However, this cannot be attained individually. The millers have an abundant amount of capital compared to the farmers. This abundance should not be only limited to lending money and fertilizers to the farmers. They can invest more to research and development activities and actively diffuse the knowledge to the growers. The growers and millers have an annual meeting when the sugar season starts. During this meeting the millers can easily provide information to the growers.

Equipments such as harvesting machine are too expensive to the growers, and sometimes they are reluctant to buy the equipments themselves because they cannot fully utilize the machine because their land is not flat. To deal with this problem, growers can collectively purchase

equipments and utilize for their farmland. The millers or any local governmental authority can support the growers. Many associations own harvesting machine, but in Manchakhiri and Khohphochai there is no association who can help the growers. This sort of effort is also necessary for labor issues. If the employment process remains unofficial as is now, the labor shortage and the issue of fraud will not be solved. The growers can cooperate with the local government and establish cooperative of workers. In this point, governmental effort would be favorable because other actors do not have clear incentive or capability to organize an association. By this association, the employment process can be managed fairly with a sufficient level of wage and arrange labor input for each growers to prevent labor shortage. If these communal efforts efficiently work, high degree of social capital will contribute to upgrading.

It is already mentioned that measuring sweetness level is not accurate. Because of its randomness, the growers feel they are cheated and not willing to improve sweetness level. Here, it is true that the millers cannot reluctantly put a small amount of canes in the crushing equipment to make sure where the canes belong to, because this would result in worse inefficiency than now. A possible solution is that pairing canes from the growers who believe each other. If one grower's canes are mixed in and measured with someone else's low quality cane, the grower will feel that achieving a high level of sweetness is a waste of effort. Whereas, if a grower combines his cane with another grower who is credible, they will feel sweetness level is measured more fairly. Surely, this is not a perfect solution because a grower cannot still be compensated by his own effort. However, gathering a collective effort ensures their neighbors or relatives to produce good quality canes. This was is much easier than dealing with the group of unknown growers. At least, not all but some growers can make collective



effort for higher sweetness level.

Besides the random measuring process, growers are not convinced whether it is fairly implemented. According to the interview with the manager of sugarcane association at Namphong district, associations are supposed to supervise sweetness level measuring process. Besides the fact that there is no association in Manchakhiri and Kokphochai, anyway the canes produced from these two districts are transported to Nong Ruea district where a huge mill owned by Mitro Phol is located. Then the association in Nong Ruea district can convince the growers in Manchakhiri and Kokphochai that the measuring process is properly carried out even they are not a member of the association. If farmers are convinced their effort for better quality is compensated fairly, they will care more about improving the sugar content than before.

Most importantly, policy institutions have to be revised. The pricing system has to value more for the content of sugar. Only six baht for one percent of sweetness level is not sufficient to encourage the growers to produce better quality canes. In addition, as the future of global sugar market is uncertain due to artificial sweets and the demand of ethanol, (Chiadamring and Kawtummachai, 2008; Higgins et al., 2007; Silaertruksa et al., 2012) the policy aims should be changed. Present institutional arrangements are merely relieving the tension between the growers and the millers at the expense of domestic consumers' utility. This type of protection is not available soon because trade liberalization is expanding to agricultural sector. However, the growers have no idea of trade liberalization which can considerably reconstruct the industry. And as Quota A is allocated based on the mills' capacity, mills are continuously expanding their capacity to enjoy higher sugar price in domestic market

(Doner and Ramsay, 2004). The Thai government should abolish the policies which are not effective anymore and implement policies to encourage a high level of productivity. Recently, the Thai government is attempting to reform the industry (NaRanong, 2013). Especially, reform is aiming to establish the new pricing system and prevent sugar shortage. It is a hopeful signal because the government perceives the necessity of reform. However, it is still most focusing on sugar trading and sugar stock not on the growers who are composing the base of the sugar industry.

There are several good examples of promoting agro-industry. Brazil, the leading country in sugar production is a one good example. It was as same as Thailand that Brazil tried to satisfy the actors within the sugar value chain. The national fund was properly invested to R&D and infrastructure. Sugar was promoted as a part of import substitution industrialization and ethanol substituted petroleum. The most important difference between Brazil and Thailand sugar industry is that in Brazil sugar value chain was vertically integrated. Because grower and miller are not separated, it was much easier to implement a policy for the interest groups in the industry (Doner, 2009). This fact may coincide with this study's argument that growers and millers should establish a more close relationship and share a same goal for higher productivity. The Ghanaian cocoa industry also can be another good example. Ghanaian government supervised the industry in almost full extent. Beside price and production control, the government built warehouses and port facilities to promote cocoa cultivation (Fold, 2014).

What if the Thai government abandons their role in sugar industry and hand over the sugar to the 'invisible hand'? It must be true that even though the high level of protection is abolished Thai sugar will have advantage in

world sugar market (Doner and Ramsay, 2004) as Thai has favorable natural environment. Also domestic consumers will benefit because of price decrease of domestic sugar. However, it is not sure how long this advantage will benefit Thailand as natural resources diminish and the labor cost increases. To cope with uncertain future, the governments' role is important.

Perhaps, discussed suggestions above are insufficient to escape from the Middle Income Trap of sugar industry. However, investing capital to the education sector and rapidly restructuring the national economy to escape from the trap is not easily accomplished. So from empirical analysis, industry and region specific implications can be a meaningful starting point for the national scale issue. If the upstream sugar value chain is gradually adjusted by the suggestions, possibly the productivity can increase and stable employments can be generated which are significant element of regional development.

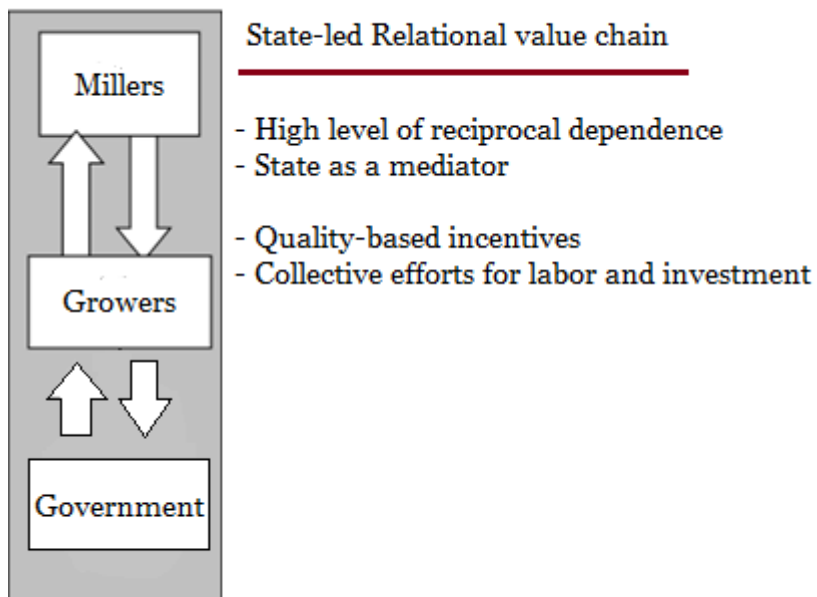


Figure 18. Conceptual visualization of suggestions

Source: Adapted from Gereffi et al.(2005)

## **VI. Conclusion**

This study attempted to scrutinize the Middle Income Trap in specific industry of specific region. From this point, it is verified that there are substantial evidences which prove Thailand is trapped in the middle income. As regional disparity is one reason of the Middle Income Trap, Northeastern Thailand where the most underdeveloped region in Thailand and sugar industry which is prevalent in the region is analyzed by empirical data.

About the first research question, in chapter 4, upstream sugar value chain is scrutinized. There is a distinction between quota growers and non-quota growers. The relation between millers and growers is not reciprocal while brokers are trying to establish a stable relationship with the growers. The second research question is about governance. Fieldwork research revealed that governance structure within the upstream sugar value chain can be classified as ‘State-led Markets value chain’. Because price is set by a government body OCSB, price could not be a proper signal to the growers and the millers which is different with markets value chain. Answering to the third research question, several factors which discourage upgrading are found. Here, upgrading is narrowed to ‘product upgrading’ and ‘process upgrading’. Low level of knowledge exchange and cooperation are main problems within the value chain and incentive system is malfunctioning.

In the 5<sup>th</sup> chapter, this study suggested that governance structure has to shift to ‘Relational’ type which can simply characterized by mutual dependence. For a successful transformation, the first knowledge exchange should be encouraged mainly by the millers. Second, agents involved in the value chain have to make a collective effort for utilizing

equipments and an efficient employment process. Third, to convince the farmers that they are fairly compensated for their quality of the canes, the new sugar content measurement can be implemented by pairing canes from neighbors or relatives. Also, associations can actively supervise the measuring process and inform the growers who are not members. Lastly, because trade liberalization is inevitable, government have to revise the policies to safely adjust to external shock. However, the recent military coup is further obscuring the role of the Thai government. Efforts for promoting sugar industry are a good prelude, and it is true that without the democratic considerations, Brazilian military government successfully promoted sugar. On the other hand, if policy reforms are not taken over by the democratic government and the political disorder continues, future of the industry will be unfavorable.

However, there are several limitations of this study. First, the manager from the weighing station cannot fully represent the millers. So there can be a bias in the interpretation of the millers' stance. Second, workers who are hired by the growers are not interviewed. Due to this, interpreting the labor process is weighted mostly to the grower side. Third, it was hard to acquire desired information from the brokers, so in this study broker side is not sufficiently discussed. Fourth, the cane growers who are interviewed are mainly smallholders. It is possible that large scale growers have different relationship with the millers.

Nevertheless, unlike previous research about the Middle Income Trap, this study attempted to apply the Middle Income Trap to a region and an industry. And to investigate the connections, Global Value Chains framework is mainly adopted. Because the Middle Income Trap is a situation that countries cannot upgrade their position within the value

chain, Global Value Chains properly connected the Middle Income Trap and sugar industry. Most of all, even though this attempt may not provide any implications for national scale discourse, this study is a meaningful starting point to interpret the Middle Income Trap from the very early stage of the sugar value chain.

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## 국문 초록

# 가치 사슬과 중진국 함정: 태국 동북부의 설탕 산업을 사례로

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최우혁

지난 수십 년 간 태국은 성공적인 경제 성장을 이루어 왔다. 이러한 급속한 성장은 1980년대 초부터 시작되었고 태국은 이로 인해 동남 아시아 지역의 선도적인 국가가 될 수 있었다. 그러나 이러한 태국의 발전상은 여러 의문점을 자아내고 있다. 그 중 하나는 중진국 함정이다. 비록 ‘중진국 함정’이라는 용어의 정의가 명확하지는 않으나 태국이 중진국 함정에 빠져 있는지 여부에 대한 의견들이 제기 되고 있다. 다른 의문점은 지역 불균등이다. 익히 알려져 있듯이 방콕과 수도권 지역은 번영하고 있으나 태국의 동북부를 비롯한 여타 지역들은 상대적으로 뒤쳐지고 있는 실정이다.

본 연구에서는 주로 국가 단위에서 논의 되던 중진국 함정을 다른 관점에서 바라보고자 시도하였다. 이를 위해 저발전 문제가 가장 심각한 동북부 지방에서 널리 행해지고 있는 설탕 산업을 사례로 하여 중진국 함정의 양상이 지역과 산업 단위에서 어떻게 발현되는지를 살펴보았다. 이러한 연구 목적을 달성하기 위하여 글로벌 가치 사슬 관점을 참고하였다. 구체적으로 본 연구는 설탕의 상위 가치 사슬에 집중하여

사탕 수수 재배 농민들과 제당 공장과의 관계를 살펴 보았다. 현장 연구는 Khokpochai와 Manchakhiri군의 사탕 수수 밭과 농촌 마을 그리고 사탕 수수 집하장에서 이루어졌다.

현장 연구를 통해 설탕의 상위 가치 사슬은 ‘국가 주도 시장 가치 사슬’로 정의 내릴 수 있었다. 가격이 정부에 의해 통제 되기 때문에 가격은 가치 사슬내의 행위자들을 조정할 수 있는 적절한 신호가 되지 못하였다. 설탕의 상위 가치 사슬은 중진국 함정의 여러 특성을 보이고 있었다. 낮은 수준의 투자와 연구 개발 활동, 노동력 부족 그리고 효율적이지 못한 제도가 그것이다. 가치 사슬 내의 이러한 문제점들을 고려한 함의들 또한 도출하였다. 비록 본 연구가 일반화할 수 있는 결과들을 담고 있지는 못하지만 중진국 함정을 국가 단위뿐 아니라 지역과 산업 단위에서 ‘생각’할 수 있다는 점에서 의미가 있다.

**주요어:** 중진국 함정, 글로벌 가치 사슬, 설탕 산업, 동북부 태국

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